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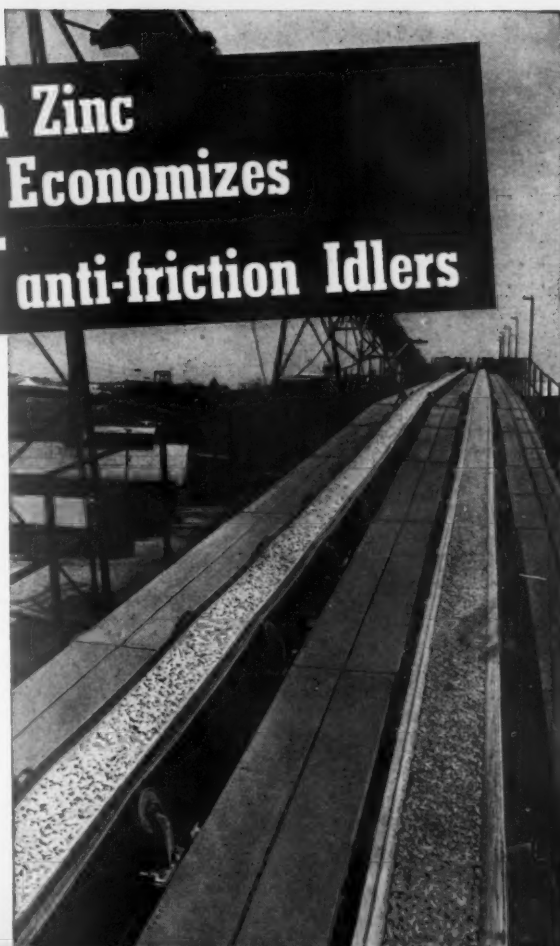
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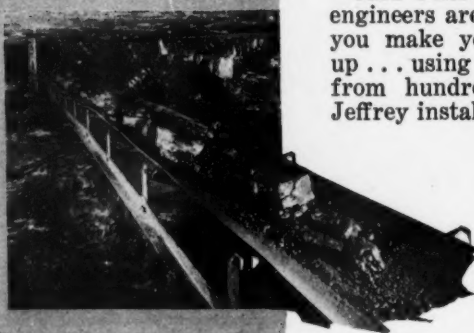
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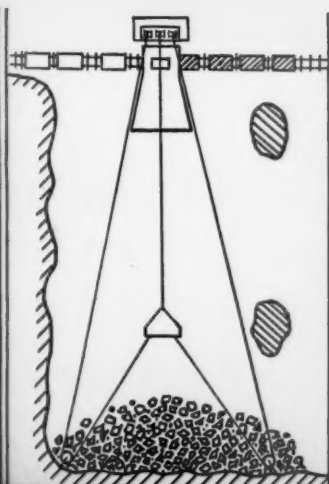
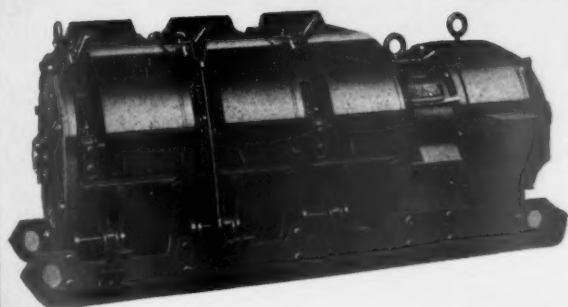
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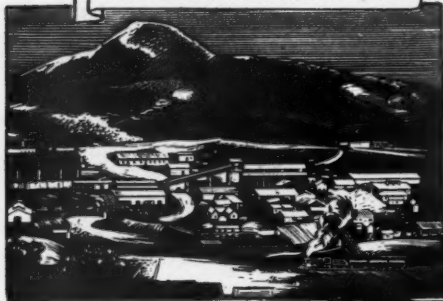
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San Francisco Mines 1936



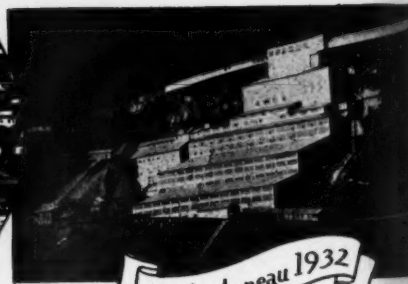
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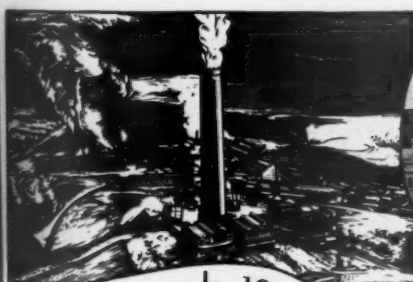
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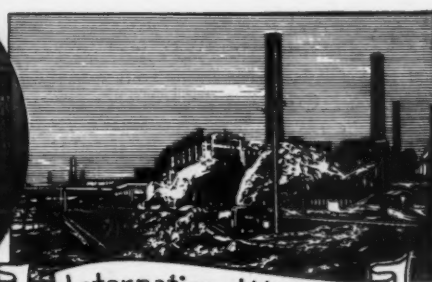
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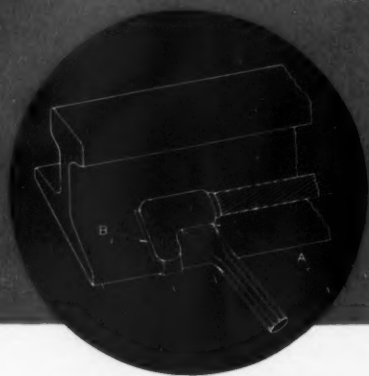
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Vol. 24

AUGUST, 1938

No. 8

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(See pages 42 and 43 for preliminary  
plans of what awaits you)

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Beautiful setting of the power plant and substation of the Pend Oreille Mines & Metals Co., on the Clark Fork River at Metaline Falls, Washington. Photo courtesy of Lewis P. Larsen, president of the company.

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*Opinions expressed by authors within these pages are their own, and do not necessarily represent those of the American Mining Congress*

Published monthly. Yearly subscription, United States and Canada, \$2.00. Foreign, \$4.00. Single copies, \$0.20. Entered as Second Class Mail Matter, January 30, 1915, at the Post Office at Washington, D. C.

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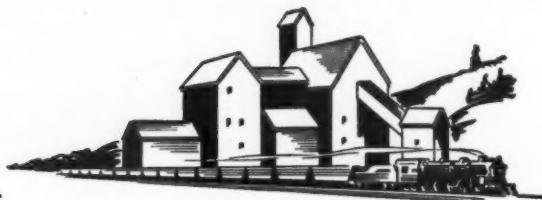
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AUGUST, 1938

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## An Experiment In Government Control

IN VIEW of the monopoly investigation now in progress under the direction of the O'Mahoney Committee, it may be well to consider its possible application to what has, at times in the past, been considered as the most objectionable of monopolies and at times the most disorganized activity of all—coal mining.

First and foremost, the attitude of Senator O'Mahoney and his committee is to be highly commended. The subject is one of very great importance, and its investigation for the purpose of laying the ground work for a better functioning of industry and not for political manipulation promises much of good.

The Coal Baron is a mythological being of the past.

The Guffey Coal Act is evidence that the administration has recognized the importance of cooperation in the production of those minerals absolutely essential to industrial progress and of which the supply is exhaustible and irreplaceable.

It is only in this field of conservation that government interference may be justified, but even this does not, in the writer's opinion, justify a government monopoly of the production of coal, nor its price fixing authority.

The Sherman anti-trust law was believed to declare illegal any joint effort toward stabilization and every proposed effort toward stabilization was met by threats of criminal prosecution. Twenty-eight years ago at a Chicago meeting alleged to represent 90 percent of the coal production of Indiana and Illinois, the writer was requested by unanimous resolution to undertake to work out a solution for the ruinous conditions then prevailing. The result was the draft of a bill for the creation of what was then called an Interstate Trade Commission.

This bill provided for a commission with authority to approve a combination among coal operators for stabilizing business, but which might be suspected of violating the anti-trust laws. If later it should be determined that activities under its provisions were contrary to these laws, the court should issue an order against further continuation of the acts complained of, with no punishment for any act done in accordance with the compact which had been approved by the Commission. This, it was then believed, would effectively clear up the twilight zone, and leave to the courts the determination of the legality of the acts done in accordance with the license granted by the Commission.

This plan was approved by many operators but flatly opposed by others, who insisted that it put the government into the coal business. The bill figured in a Senate hearing, but was never presented to Congress, because of the accepted belief that no bill interfering with the sacred fetish of the Sherman law could possibly meet approval without the united backing of the coal industry.

The bill emanating from the Chicago conference provided that acts which might or might not be violations of the anti-trust laws might have this question determined in advance without criminal prosecution. The Federal Trade Commission, instead of being an agency through which the wastes of cutthroat competition could be avoided, became only an additional agency for prosecution of those who attempted to do what the present Guffey Act requires them to do.

The present coal regulatory laws are radical experiments and a reversal of all prior governmental attitudes, the success of which is expected by a few, hoped for by many, and thought to be dangerously experimental by many others.

Experience alone can definitely determine the results.

*J. H. Bell*



## MINING CONGRESS JOURNAL

Vol. 24

AUGUST, 1938

No. 8

Richard J. Lund, Editor

### THE POLLUTION PROBLEM AGAIN

THE presidential veto of H. R. 2711, the Vinson stream pollution bill, will probably result in reopening this highly controversial subject in the next Congress.

In connection with this general problem, it has recently been announced that the iron and steel industry, which for many years has endeavored to solve pollution problems resulting from processing operations, has founded a fellowship at Mellon Institute through which it is hoped to discover new methods of solving the problems as soon as possible. The investigations will aim at removal of certain deleterious chemicals from waste solutions, and turning these into a profitable by-product. Action of this character certainly is clear evidence that industry is endeavoring seriously to solve these problems itself.

The mining industry already has made significant strides in overcoming many of the perplexing matters involved in stream pollution. One has only to view some of the extensive tailings ponds and dams, with intricate systems of utilizing every cubic foot to best advantage in impounding the waste material from milling operations, to realize fully the gains already achieved. True, many of these were installed as a result of local laws; but the situation has been handled effectively in this manner, without Federal intervention. Likewise, the bituminous coal industry has spent large amounts on sealing abandoned mines, thus preventing acid mine waters from entering the drainage system.

This does not mean that further advances cannot be made. But the principles enunciated repeatedly by the American Mining Congress regarding stream pollution have always set forth that the extreme complexities involved in the problem can best be handled locally; fur-

thermore, that the relative necessities and requirements of industries and the communities dependent thereon should be given fullest consideration as compared with communities that may be affected by such wastes—the principle referred to as the balancing of conveniences or necessities.

With the probability that legislation more stringent than H. R. 2711 may be pressed in the next session of Congress, it is not too early now to consider the problem carefully and prepare additional factual material supporting positions taken in the past.

### DAMS AND MINING

WHENEVER announcement is made that millions of dollars of public money is scheduled to be spent in construction of some new dam, the news is apt to be received with alarm by the mining industry.

Although certain of the large projects already completed or now in process of construction have been of marked benefit to western mining communities by supplying cheap power for future operations, by and large the tremendous quantities of hydroelectric power generated by dams that have mushroomed throughout the country during the past decade have displaced millions of tons of coal as an energy source for power previously utilized, and have thus contributed heavily to the serious drop in coal mine employment that has developed over a similar period of time.

It is therefore with genuine pleasure that word is received of plans for the Federal Government to construct four very sizable dams in central California, the principal object of which is to impound waste from hydraulicking gold-bearing gravels still available in large quantities in the area.

Interested parties have worked industriously for many years (see pages 12 to 15) toward effectuation of these plans, whereby the hydraulic mining industry of California, once a robust and romantic enterprise, would be revived. Much credit is due the California Hydraulic Mining Association for the effective work done toward successful outcome of the case.



Typical hydraulic mining operation in central California. Scenes like this will soon be repeated, with construction of the new debris dams

## HYDRAULIC MINING To Resume In Central California

**I**N SO FAR as the hydraulic miners of central California are concerned, the year 1938 will always be remembered as one in which their long-cherished dreams came true.

From the date of the first discovery of gold in California, on January 19, 1848, until the rendering of the Sawyer decision on January 23, 1884, over \$100,000,000 had been invested in hydraulic mining equipment, while at the same time employment was given to a large number of men, and industry and trade benefited generally as a natural result. One billion dollars' worth of gold was produced during 36 years.

### Clash of Interests of Farmers and Hydraulicminers in Early Days

With the passage of years and the phenomenal increase in population in this state, succeeding the first gold rush, the number of emigrants who came to California with the avowed purpose of following agricultural pur-

### • *Four Debris Dams Planned by Federal Government to Impound Over 200 Million Yards of Waste From Hydraulicmining*

By W. G. ALLEN

Director-at-Large  
California Hydraulic Mining Association, Inc.

suits increased tremendously. It was perfectly natural that these farmers should choose the rich valley lands along the banks of existing rivers, where the land was unusually productive and transportation facilities were all that one could ask for. These rivers generally headed in the high Sierras, and on their way to the rich valleys below meandered through the great channels of auriferous gravels.

The hydraulic mining operations, which had speedily advanced from work with pans to the long tom, then

to the short sections of sluice boxes and the installation of short, make-shift pipe lines, soon resulted in the wholesale diversion of existing streams. Then came the construction of hundreds of miles of ditches, flumes, and tunnels, so that sufficient head could be acquired to utilize the water under pressure, and thus move great quantities of gravel within a short space of time.

Before the end of the '70s the farmers in the lower valleys complained of the hydraulic mine debris that was

brought down to the lower levels, raising the elevation of the stream beds, naturally increasing the danger of overflow during the flood periods, and at the same time constituting a hindrance to free, all-year navigation in these same streams.

There never was any doubt as to the equity of the attitude assumed by the agriculturists, and after years of a growing antipathy between the miners and the farmers, the situation was settled by a United States Circuit Court decision, amounting to an injunction, that prohibited any form of hydraulic mining where the debris discharged into any of the streams tributary to the Sacramento or San Joaquin Rivers.

Coming, as it did, at the very peak of hydraulic mining activities, it was a terrific blow to the operators, who, over night, found their investment in properties and equipment made worthless. Thriving towns, as soon as they were able to realize the power of the decision, became "ghost towns," and with the exception of a few so-called "die hards," the gold-bearing mountain districts were abandoned to stock men and campers.

Late in 1891 a small group of determined hydraulicickers, feeling that some way could surely be worked out between the farming and the mining interests, so that both could proceed without harm to the other, met in Auburn. Through this meeting a state convention was called, and Congress was petitioned to consider a plan that would permit the resumption of hydraulic mining.

#### **Caminetti Act Sought Solution in 1893**

In 1893, Congress passed a bill known as the Caminetti Act, which provided for the appointment of three high-ranking officers of the Corps of Engineers, United States Army, to comprise what was to be known as the California Debris Commission. The duty of this body was to restore the navigability of the rivers involved to their status of 1860; to undertake surveys, examinations, and installations that would permit of the resumption of regulated hydraulic mining. The Caminetti Act, while it also provided for the construction of debris-impounding dams with funds to be made available or advanced by the Federal Government, was not capable of being put into practical use. This was because the Act called for repayment of the debt to the Government by a fixed percentage of the gold produc-

tion of the mines. Further studies showed that the Act was unsatisfactory in many ways to both the Federal Government and the miners.

#### **Amendment Proposed by Englebright 40 Years Later**

During the Seventy-third Congress the Representative from the Grass Valley mining district, and present incumbent, Harry L. Englebright, was instrumental in having passed an amendment to the Caminetti Act, which, while calling for the construction of the debris dams by the Government, arranged for the liquidating of the costs by a levy per cubic yard in place of all gravels worked.

In 1933, conditions throughout the country indicated that the time was right to convince the authorities that the resumption of hydraulic mining would not only work a benefit to those who were directly interested in the profits appurtenant to the production of the yellow metal, but that it would increase the gold reserves and provide long-term employment for a large number of men, both of which were generally known to be very necessary moves toward victory over a nationwide depression.

The first constructive move toward rehabilitation of the hydraulic mining industry was the allotment of \$95,000 by the Chief of Engineers for a report, including surveys, plans, and estimates involved in the resumption of hydraulic mining. Then followed two or three years of studies covered by numerous documents emanating from the offices of the District Engineer, to the Board of Army Engineers in Washington. One particularly disheartening period followed the recommendation of the Debris Commission that the Federal Government take no part in subsidizing the plans for bringing back to life hydraulic mining. This report, however, was subsequently reversed.

#### **Effective Miners' Organization Formed**

In the meantime the miners organized and incorporated under the name of "California Hydraulic Mining Association," and included within its membership not only all who are directly interested in the future of hydraulicking in this part of the state, but hard-rock miners, dredgers, supply men, and others as well.

This representative group undertook to work with the Army Engineers on the numerous and complicated problems that were involved, and showed a concentration, tenacity, and deter-

mination of purpose that has played no small part in the final victory. Because of the situation being fraught with so many unusual and unique angles and complexities, with which few, if any, were familiar from actual personal experience, the road was not an easy one.

#### **Assurances Demanded by Government**

The Federal Government demanded assurances from the prospective operators, which, after all, could be viewed only as an ordinary business procedure, but which was supplied to the satisfaction of the Government only after more than a year of strenuous endeavor.

These assurances called for a description of the gravels to be worked, including their historical record and a reasonably accurate estimate of values involved; the source of water supply; the title to that water; the presumed number of working days counted on in each year, based on past weather and rainfall records; the plans of the operators so far as construction of pipe lines and flumes or tunnels were concerned; the personnel; and the financial ability of the individual or company supplying the foregoing information.

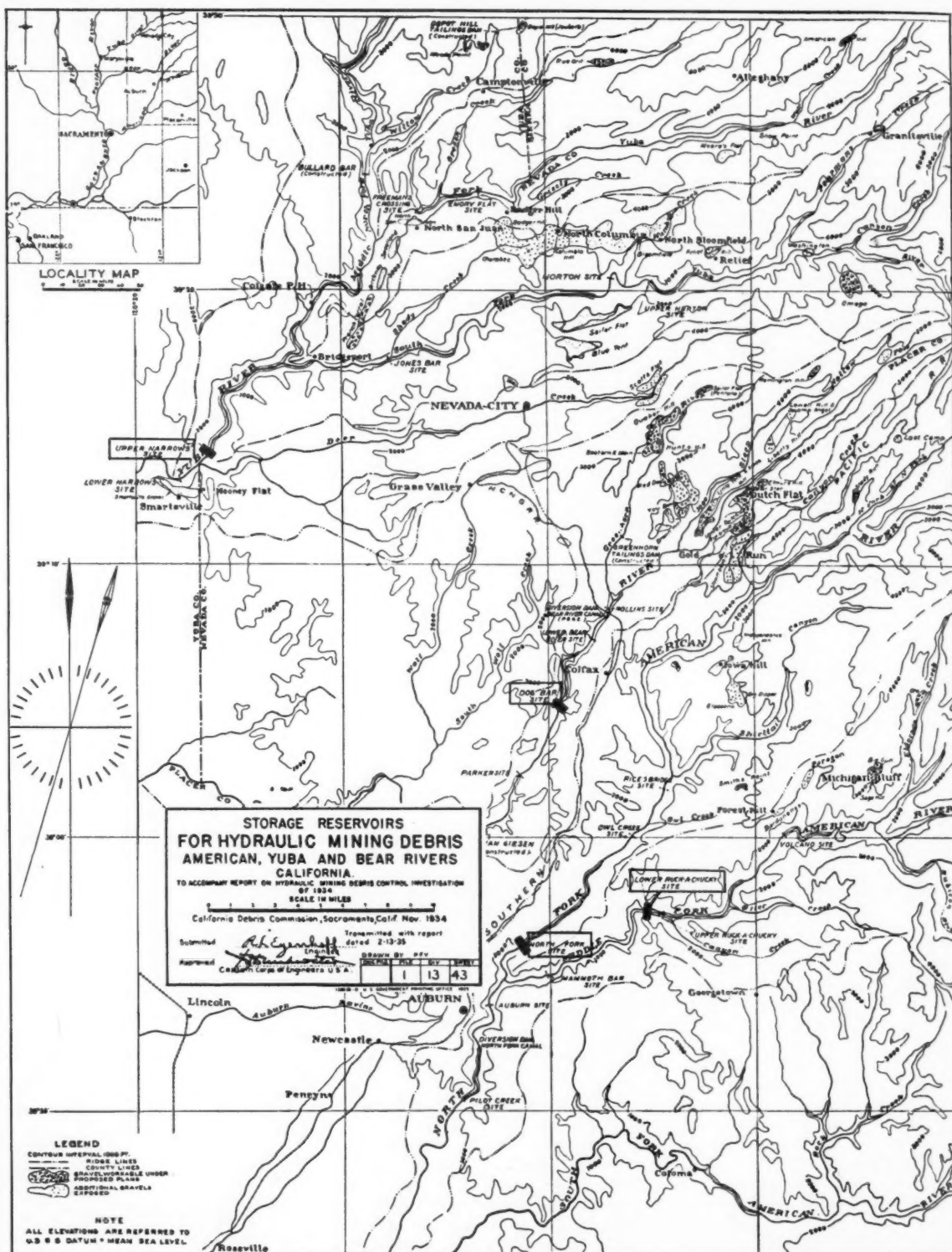
Because of a difference of opinion between the Army Engineers and the miners regarding the estimated duty of water in cubic yards of gravel capable of being moved per 24-hour inch, the Government demanded assurances in amounts far in excess of the capacity of each one of the impounding units. This safety factor for a time held the possibility of wrecking the entire plan, but through the maintenance of mutually respectful attitudes, each for the other, a satisfactory solution was agreed upon, and the project was submitted to the Chief of Engineers in Washington for approval.

The main streams involved in this forthcoming activity comprise the Yuba River, with probably 400,000,000 cu. yd. of auriferous gravels tributary to it; the North Fork of the American River, with 87,000,000 cu. yd. involved; the Middle Fork of the American, with its 76,000,000 cu. yd.; and the Bear River, with 53,000,000 cu. yd. (see map).

#### **Yuba Dam to Impound 118 Million Yards Mining Debris**

On the Yuba River at what is known as the Upper Narrows dam site, it is proposed to construct a con-





crete dam of the arch type, 237 ft. high, with a length on the crest of 1,000 ft., resulting in a maximum impounding capacity of 136,000,000 cu. yd., of which 118,000,000 cu. yd. are

reserved for mining debris. The remainder is estimated to take care of the natural erosion during the term necessary to work the 118,000,000 cu. yd. of mining material.

A low-head hydroelectric plant of an average annual output of 61,590,000 kw.-hr. is contemplated, and it is figured that the net proceeds from the sale of this power will be applied

as a credit against the cost of the dam, thereby lessening storage costs to the miners. The entire cost of the impounding unit, without the power plant, is estimated at \$4,200,000, with two years necessary for completion.

#### Other Three Dams to Impound 76 Million Yards

On the Middle Fork of the American, at what is known as the Ruck-a-Chucky site, a dam estimated to cost approximately \$750,000, and providing storage for 24,000,000 cu. yd., is included.

On the North Fork of the American River, about nine miles from the city of Auburn, a contract has already been let for a dam calling for the pouring of about 29,000 yd. of concrete to a height of 148 ft., and a crest length of 620 ft. This unit is estimated to cost in the neighborhood of \$900,000, and will impound 26,000,000 cu. yd. of debris.

The site for a dam on the Bear River was chosen at Dog Bar, where preliminary figures estimate a capital cost of about \$1,200,000 for the impounding of 26,000,000 cu. yd. Plans for development on the Bear River, however, are not definitely settled because of water interests claimed by the miners and by the Pacific Gas & Electric Co.

#### Present Status of Projects

About a year ago five tunnels were driven into both abutment sites at the Upper Narrows on the Yuba, in order that a careful study of the geological conditions be made. This examination was completed early this year by Dean Louderback, of the University of California, and his report was favorable.

Early in June \$1,000,000 was allocated to the dam on the Yuba River out of the additional allotment of \$20,000,000 made in Washington for Rivers and Harbors projects. Plans for the structure are complete in the office of the Debris Commission, and it is promised that immediately upon the acquisition by the Government of certain lands involved, bids will be called for and work will start before the end of this summer.

It is presumed, of course, that the additional allocation of funds will be made as becomes necessary, so that this unit will go ahead to completion without interruption, or undue delay.

At the Ruck-a-Chucky site on the Middle Fork of the American River, surveys and some exploration work have just been completed. In the

absence of definite plans, it will probably be two years before mining behind this point will start.

It has been estimated that the completion of these dams will result in the production of \$600,000,000 worth of gold, and an era of comparative prosperity and security in the district is anticipated.

Plenty of competent labor is now available, so that those seeking employment are advised against undertaking any expense to apply for jobs unless they have been assured of a place beforehand.

We are of the opinion that the details of all negotiations leading up to this assured resumption of a major industry might not be interesting if set forth here at this time. But the success of the efforts of the miners could not have been accomplished

without the ready cooperation, patience, and sympathetic understanding of General E. M. Markham, former Chief of Engineers in Washington; General Schley, Chief of Engineers in Washington at the present time; his assistant, Captain Lucius D. Clay; and particularly the members of the California Debris Commission, consisting of Colonel Warren T. Hannum (presiding officer), Colonel L. B. Chambers, and Major Frank M. Johnson. Much credit is also due Major W. E. Harris, Corps of Engineers, U. S. A., who has devoted a great deal of his time for the past two years on this project, and to Civilian Engineers Stanley, Goodall, Egenhoff, and Thurston.

The miners naturally and rightfully feel that there would have been little, if anything, done had it not been for the work on their behalf of Congressman Harry L. Englebright.

#### Safety Trophies Awarded

Notable records achieved by mines and quarries in the prevention of accidents among mineral workers were recognized in the announcement of the winners in the National Safety Competition of 1937 made recently by Dr. John W. Finch, Director, Bureau of Mines, U. S. Department of the Interior.

Three hundred and eighteen mines and quarries operating in 36 states participated in this, the 13th annual safety contest conducted by the Bureau of Mines.

Four underground mines and one open-cut mine, each a leader in its group, were awarded the "Sentinels of Safety" trophies, donated by the *Explosives Engineer* magazine. Relative standing in the contest was based on the number of days lost from accidents in proportion to the total number of man-hours worked.

The five groups comprising the contest were: Anthracite mines, bituminous coal mines, metal mines, non-metallic-mineral mines, quarries and open-cut mines.

The trophy for anthracite mines was won by the Jeddo No. 7 mine, Harleigh, Luzerne County, Pa. Operated by the Jeddo-Highland Coal Company, this mine worked 210,599 man-hours during 1937 with 15 lost-time accidents causing 300 days of disability to the men. The award of the trophy was made on the accident-se-

verity rate of 1.425 days lost per 1,000 man-hours of exposure to hazards by the employees. The mine was in operation 241 days.

Among the mines of the bituminous coal group, the trophy was awarded to the "D" mine, Superior, Sweetwater County, Wyoming. This mine was operated by the Union Pacific Coal Company and worked 301,051 man-hours in 1937 without an accident causing loss of time to the employees. The mine was in operation 215 days.

The Hiawatha No. 1 iron ore mine, Iron River, Iron County, Mich., was awarded the trophy in the metal-mine group. This mine was operated by the M. A. Hanna Company, and worked 331,186 man-hours in 1937 without a lost-time accident. It was in operation 257 days.

The winner of the trophy in the non-metallic-mineral mine group was the No. 5 Limestone mine, Bessemer, Jefferson County, Ala. This mine was operated by the Tennessee Coal, Iron & Railroad Company and worked 173,096 man-hours during 1937 without a lost-time injury to any of the men. It was in operation 240 days.

The trophy for the group covering quarries and open-pit mines was awarded to the Illinois State Penitentiary limestone quarry, Menard, Randolph County, Ill. This quarry was operated by the Illinois State Penitentiary, and worked 772,160 man-hours in 1937 without a lost-time accident. The quarry was in operation 235 days.



A large shipment of prepared coal leaving Scotts Run

## Modernization in the Scotts Run & Maidsville Districts, West Virginia

**L**ITTLE note has been made of the extensive modernizations that have been made in the mines of the Scotts Run and Maidsville Districts during the past two years. Within this short period the field has changed from an entirely hand-loading basis to nearly 100 percent mechanical loading. As is usually the case, changing from hand loading to mechanical loading brings a whole series of modernizations in its wake, and this field has been no exception to the rule.

The operators of this area, in anticipation of changes in the coal industry, have been making many improvements to their properties. These modernizations have changed the whole aspect of this mining region and have been an important factor in helping the mines to meet competition and remain in business.

This coal field, comprising these two districts, is situated in Cass and Grant Districts, Monongalia County, in northern West Virginia. It includes all of the region on the west side of the Monongahela River between Morgantown on the south and the Pennsylvania state line on the north, and extending westward about six

- *New Improvements Underground and at Surface Plants Have Changed Aspect of Region and Permitted Mines to Meet Competition and Maintain Operations*

By CHARLES E. LAWALL

Director, School of Mines  
West Virginia University

miles to the town of Cassville (see Fig. 1); the whole field embraces an area of about 27 sq. miles.

The Monongahela River drains all of this coal field and its surrounding area. Scotts Run and Robinson Run are the chief tributaries within the field. Scotts Run empties into the Monongahela River at Randall at an elevation of 825 ft., and Robinson Run empties into the river at Maidsville at an elevation of 820 ft.

### Geology of the Field

The topography of this region is very rugged, elevations varying from 800 to 1,450 ft. above sea level.

There are four beds of coal in this field that have been mined commercially; namely, the Pittsburgh, Redstone, Sewickley, and Waynesburg. All of these beds are of Carboniferous age and are in the Monongahela series, which in this region varies in thickness from 350 to 400 ft. The Pittsburgh bed is the basal member of the series, and the Waynesburg, lying about 400 ft. above the Pittsburgh coal, is the top member. The Dunkard series of rocks lie immediately above the Waynesburg coal and contain the Washington coal bed which outcrops only in the tops of the highest hills in the region. Thus all the strata represented in the field, which are



principally sandstones, limestones, shales, and fire clays, are included in the interval between the Washington coal at the top and the Pittsburgh coal at the base (see Fig. 2).

All of the coal beds outcrop at the surface within the field, and nearly all the mines are opened in the outcrops along the streams. Thus, with easy access to the mines, little trouble is encountered getting railroad connections to the mine openings. There are also paved highways into every mining community in the region.

Very rarely do so many minable beds of coal occur so closely together. The Pittsburgh coal which extends throughout the entire field is overlain by the Redstone bed about 40 ft. above it, and the Redstone bed in turn is overlain by the Sewickley coal within an interval of 50 ft. Thus, within an interval of 100 ft. there is a total thickness of 18 ft. of minable coal. The Waynesburg bed, not mined at present, varies from 4 to 5 ft. in thickness and occurs about 300 ft. above the Sewickley bed.

The Pittsburgh and Sewickley beds are the only ones being mined at the present time. The Pittsburgh bed is the one most extensively mined, and averages 8 ft. in thickness. The Sewickley coal, which attains its best development in this field, is about 5½ ft. thick and has the same general uses as the Pittsburgh coal.

The Pittsburgh bed outcrops high in the hills at the mouth of Scotts Run where it is mined by drift openings. It dips gradually toward the northwest about 2 percent so that it has to be reached by slope at the Pursglove No. 5 mine. The Sewickley bed at the Continental Coal Company at Cassville lies 206 ft. below the surface, and is mined by both a shaft and a slope at this mine.

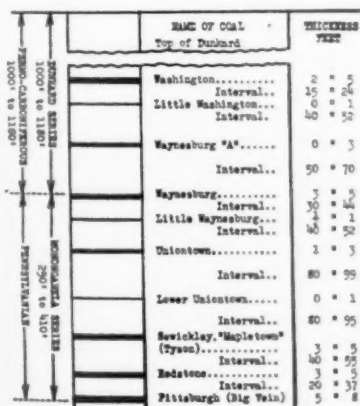


Fig. 2. Geologic section of coal beds found in the district



Fig. 1. Mines Working in the Scotts Run and Madsville Districts

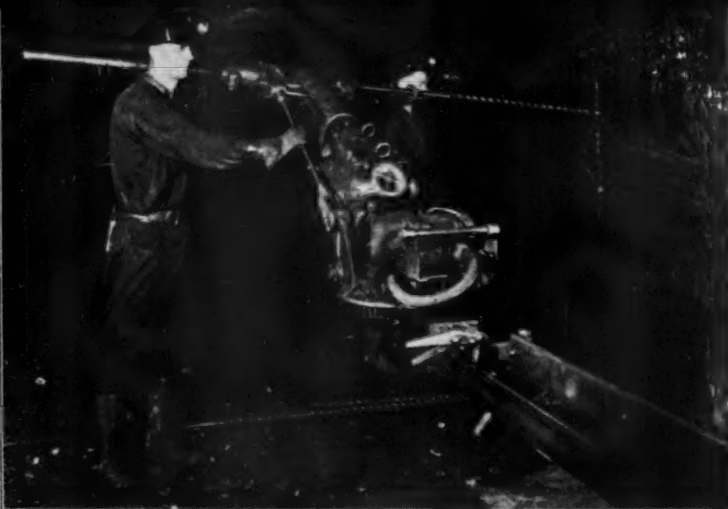
Map No.	Name of Company	Name of Mine	Coal Bed Worked
1.	Continental Coal Co.	Brock	Sewickley
2.	Davis-Wilson Coal Co.	Bunker	Sewickley
3.	Pursglove Coal Mining Co.	Pursglove No. 2	Sewickley
4.	Pioneer Block Coal Co.	Louise	Sewickley
5.	Pioneer Coal Mining Co.	Osage No. 1 & No. 2	Pittsburgh and Sewickley
6.	Pursglove Gas Coal Corp.	Pursglove No. 5	Pittsburgh
7.	Pursglove Coal Mining Co.	Pursglove No. 1	Pittsburgh
8.	Arkwright Coal Co.	Mona	Pittsburgh
9.	Monongahela Rail & River Corp.	Emily	Pittsburgh
10.	Christopher Mining Co.	Robinson Run No. 2	Pittsburgh
11.	Rosedale Coal Co.	Rosedale	Pittsburgh
12.	Christopher Mining Co.	Robinson Run No. 1	Pittsburgh
13.	Kelley's Creek Colliery Co.	Maiden	Pittsburgh

### History of the Field

The development of this field has been phenomenal in more ways than one. In looking back over its history one is impressed with the rapidity of the changes that have occurred during the past 20 years. Its development, like most other coal fields, was concomitant with the growth of a railroad. Its commercial development really started in 1914 when the Monongahela Railroad was completed to Reevesville, W. Va. Prior to this the Morgantown and Dunkard Valley railroad, later known as the Morgantown and Wheeling Railway, which was an electric passenger railway, was started in 1908 from Morgantown to

Randall; then in 1914 it was graded to Blacksville, and in 1916 it was converted to a steam railroad line and extended to Brave, Pa. It was then connected to the Monongahela railroad at Randall to serve the Scotts Run field. The Morgantown and Wheeling railroad was sold in 1923 to the Scotts Run Railway Company, and on February 5, 1925, it was leased to the Monongahela Railway Company over which all the rail coal is now shipped.

The Great Scott Coal and Coke Company opened the first mine in the field at the mouth of Scotts Run in 1902 in anticipation of plans of Senator Stephen B. Elkins to extend the Morgantown and Kingwood railroad across the river at Morgantown and



Power drilling speeds up preparation of places for loading machine



Jeffrey L-400 loading machine loading Pittsburgh coal



A Myers-Whaley shovel developing entries in Pittsburgh coal



A Jeffrey 20-ton locomotive hauls 1,500 tons of Pittsburgh coal from this mine every shift

down the west side of the Monongahela river to connect onto the Pennsylvania railroad near Greensboro, Pa. As this road was never built, the Great Scott Coal & Coke Company shipped its coal on the river until 1907, when it constructed an aerial tramway across the river to connect with the Baltimore & Ohio railroad on the east side of the river. This mine shipped its coal to industrial plants in the Pittsburgh district and was the forerunner of the intensive mining development that occurred later.

When the Monongahela railroad was built on the west side of the Monongahela River, the North American Coal Company opened a mine at Maidsville and shipped its first car of coal on July 8, 1914. Following this the Anchor mine of the Scotts Run Coal Company was opened along Scotts Run. Before this mine was ready to ship coal, the Berry mine of the Berry Coal Company shipped a car of coal on the Morgantown & Wheeling railway during the last week in January, 1917. This was followed by a shipment of coal from the Anchor mine during the first week in February, 1917.

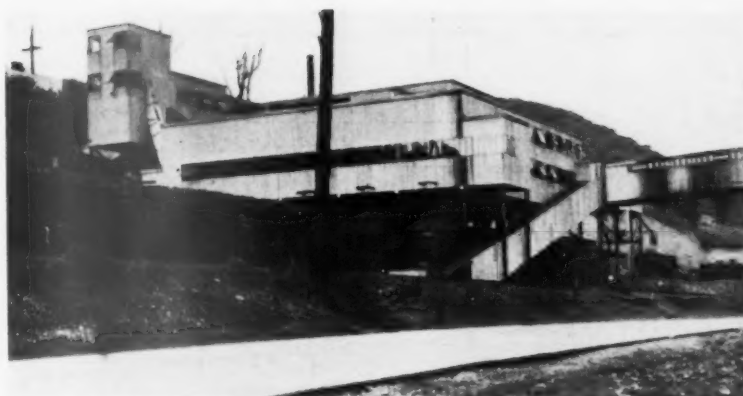
Thus began an era of development and production of coal in this field which grew by leaps and bounds throughout the World War. The tremendous demand for coal during this period gave a great impetus to the region so that in 1923 there were 50 mines working. During this boom period mines were opened, and before they were fully developed they were sold at exorbitant prices. Coal lands increased from \$6-\$8 an acre to \$2,000 an acre, and during the war coal was selling from \$11 to \$14 a ton. The whole field during this period resembled a gold mining boom. Fortunes were made and lost in a comparatively short time. There were jobs at good wages for everyone who wanted to work.

Over a period of 15 years, however, the 50 mines producing 5,978,527 tons and employing 3,952 men in 1923 have dwindled to 14 mines producing 4,581,794 tons and employing 2,802 men in 1937. To show the effect that the opening of this field had on the production of coal in Monongalia County, it should be observed that in 1917 the production in the county was 841,571 net tons; in 1925 at the peak of the production of the field the tonnage increased to the all time record of 11,780,607 net tons.

## Modernization of Mines

The modernization of this field has evolved tremendously during the past two years. Its whole aspect has been changed and is continuing to change. Under the pressure of producing cheap coal, cost reducing coal mining machinery has poured into the mines, and it is producing remarkable results.

The mines of the district have unusually good conditions for mobile coal loaders. The coal is high enough to accommodate large machines; the roof and bottom are fairly good so that only a moderate amount of timbering is needed; and large mine cars can be used, thus enabling larger tonnages to be obtained from the machines. No one particular kind or type of machine is used in the mines. Diversified conditions in the various mines dictate the type of mechanical underground



One of the new tipples in the district with a very modernistic appearance

but were finally discarded in 1924 due to price decline and general wage reductions which made it uneconomical to work them.

The Continental Coal Company was

The Mona mine of the Arkwright Coal Company also experimented with several types of mobile loaders in 1926. The Connellsville-By-Product Coal Company, now Pursglove No. 5 Mine, in 1926 used Jeffrey 44-B conveyor loaders on faces and Jeffrey 47-A conveyors on entries.

This background of experience with mobile coal loaders on the part of these companies probably accounts for the rapidity of change to them when economic pressure compelled the operators to produce cheaper coal.

In 1937 4,581,794 net tons of coal were produced in this field. Of this amount 3,610,590 net tons or 87.5 percent was mechanically loaded. The same year this field produced 3.85 percent of the total amount of coal produced in West Virginia, with 2.44 percent of the total number of men employed in the coal industry of the State. This is a measure of the productivity of the men in this field compared to the State as a whole. During 1937 2,802 men were employed inside and outside the mines in this district, compared to 114,836 men employed in all of the mines of the State.

There are no underground coal conveyors in this field at the present

TABLE 1.—MOBILE LOADERS IN USE IN COAL MINES OF WEST VIRGINIA AND IN SCOTTS RUN AND MAIDSVILLE DISTRICTS

	1934	1935	1936	1937
Scotts Run and Maidsville Districts....	0	6	37	50
West Virginia .....	35	42	125	183

TABLE 2.—COAL LOADED MECHANICALLY IN COAL MINES OF WEST VIRGINIA AND IN SCOTTS RUN AND MAIDSVILLE DISTRICTS (Net Tons)

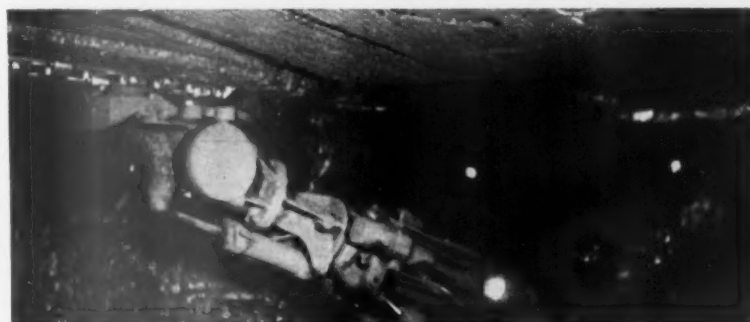
	1934	1935	1936	1937
Scotts Run and Maidsville Districts....	0	290,379	1,616,463	3,610,590
West Virginia .....	1,216,463	2,059,322	8,706,785	15,490,863

equipment best adapted for each mine, so that practically every type of mobile loader and cutting machine is being used in the field.

The miners of this region have been unusually adept in changing over from hand to mechanical loading, so that already the groundwork for further mechanization of the mines has been laid. Experiments with new systems of mining and more scientific planning are continually being made, resulting in better performance records over the whole district.

It is interesting to note that this field was one of the pioneers in the use of mobile loaders in the mines. Early in 1922 the Shriver Coal Company purchased a Joy-SBU track mounted loading machine, and at a later date purchased three more of the same machines. About the same time the Gilbert-Davis Coal Company purchased two 4BU Joy loaders for their Davis No. 1 Mine. These machines did very good work in these mines,

also a pioneer in the use of mobile loaders. It purchased a Jones Coloader in 1928 and worked it until very recently. This company also experimented with a machine of its own design for many years. They built a Continental track mounted loader in 1928 and used it until they put in Joy mobile loaders about two years ago.



Sullivan universal cutting machine top-cutting in Pittsburgh coal



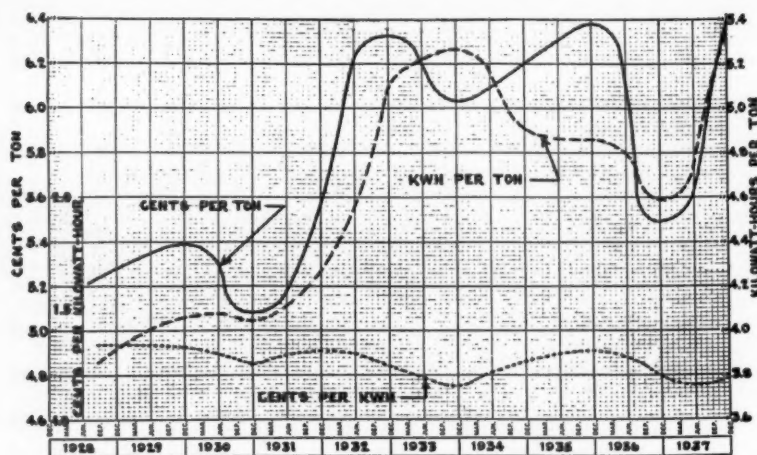


Fig. 3. Amount and cost of power in all coal mines in the Scotts Run-Maidsville districts

time. All the coal loaded mechanically is done with mobile loaders. Logan County is the only county in the State that surpasses this field in the loading of coal with mobile loaders.

#### Amount and Cost of Power

A rather vivid picture of the development of this field can be obtained by studying the power consumption and cost trends for the past 10 years. See Fig. 3.

From the chart it will be noted that the cost in cents per kilowatt hour used shows a definite downward trend during the past 10 years. This is due in a large part to the increased use of power, owing to the modernization of the mines.

The "Power Cost in Cents Per Ton" curve shows that there has been very definite changes in the industry in the years 1931, 1933, 1934, 1936 and 1937 due to market conditions. During these years there have been marked decreases in the tonnage of coal produced and the reduction in the cost of power per ton was evidently due to strict economies in its use during the depression period.

It should be noted that beginning in 1937 there is an extremely sharp upward trend of the kilowatt hour

per ton curve. This is due entirely to the increased use of mechanical equipment in the mines. The cost per kilowatt hour has been reduced, due to this era of modernization and mechanization which increased the use of electrical energy and also improved the load factor of the mines.

#### Systems of Pillar Drawing

In general, two systems are used in extracting pillars in this field. In the first system (Fig. 4), which is a room and pillar system, the rooms are driven 11 ft. wide on 60-ft. centers. The breakthroughs are driven on an angle of 72 degrees with the center line of the room, and the pillar is mined open-ended, leaving a series of triangular shaped fenders of coal between the working face and the gob.

It requires six cuts to penetrate through the pillar. The places are cut and timbered as shown in the sketch, the triangular blocks being made by shearing on the gob side of the working place. The rooms are usually driven in groups of four or five on the full retreat system, the pillars being extracted as soon as the room is driven its full length of 300 ft. Cross bars are set as each cut

is made to protect the machine operator.

The other general system of mining is the block system (Fig. 5). In this system pillars about 90 ft. square are developed by driving rooms 16 ft. wide. The pillar is then split through the middle by an opening (F) 15 ft. wide. This opening is driven through to the gob area, and then a series of four rooms B, C, D and E—20 ft. wide—are driven at right angles to it.

Timbers are set as shown on sketch, usually on 4-ft. centers with rows 5 ft. apart. Additional timbers are set whenever required, and breaker posts (H) may or may not be recovered. The last fender shown in room B is recovered by the loading machine from track A when room B is completed. Fenders are usually left between working places and the gob. Some systems do not leave them, but extract the pillars completely by open-ending.

When room D is driven half way up its full length, then room R is started on the lower right hand corner of the pillar.

#### Markets for Coal

This field is so situated that in order to get its coal to markets, it must ship through one or more competitive coal fields which have freight differential advantages to the same markets, varying from 15 to 35 cents per ton. Under such adverse conditions it has been necessary for the operators of this field to display unusual resourcefulness in the solution of their problems to stay in business.

By careful preparation of the coal at the face, by mechanical cleaning plants and modern tipples, and by strict economies in the operation of the mines the mining companies have been able to overcome many of the disadvantages inherent to their field. During the past year three mechanical cleaning plants have been built, and these were the first that were installed in northern West Virginia. The types built were a Jeffrey Baum Jig Washer (three compartment), having a capacity of 275 tons per hour; a Chance

TABLE 3.—TONNAGE AND POWER COSTS FOR ALL MINES IN THE DISTRICT—1928-1937

	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937
Power costs.....	\$263,333	\$263,543	\$229,836	\$205,993	\$196,584	\$181,746	\$206,507	\$226,414	\$238,647	\$293,214
Tons produced ..	5,002,915	4,886,518	4,526,483	3,691,992	3,102,636	3,010,208	3,346,555	3,550,492	4,351,015	4,581,794
Kwh. used .....	19,607,201	19,850,765	18,308,109	15,722,639	15,824,920	15,857,175	16,456,207	17,251,500	19,981,596	24,459,740
Kwh. per ton.....	3.92	4.06	4.04	4.27	5.10	5.27	4.91	4.86	4.59	5.34
Costs per kwh....	1.34	1.33	1.25	1.31	1.24	1.15	1.26	1.31	1.19	1.19
(Cents)										
Cost per ton....	5.28	5.39	5.08	5.57	6.33	6.03	6.20	6.38	5.49	6.39
(Cents)										



All the mines are endeavoring to give their men 100 percent first aid training and the district actively supports the Monongahela Valley Coal Mining Institute which is exclusively devoted to safety in the mines. Several of the mines have chapters, 12 chapters in all, of the Joseph A. Holmes Safety Association. Probably more chapter meetings have been held in this district during the past four years than any other district in the United States. Night mining classes have played an important part in the safety program of this district. These classes have been conducted every year in this district and in Morgantown by the School of Mines of West Virginia University, since 1913. These classes have given the men an opportunity to learn more about their jobs and prepare themselves for official positions. During the past year 55 men from this field were enrolled in the extension mining class.

The Mona Mine of the Arkwright Coal Company has had an enviable safety record, working from June 27, 1930, to December 27, 1937, producing 2,226,576 tons without a fatality.

During the year 1937 when most of the modernization of the mines was taking place, the accident record of the field was as shown in Table 5.

With this district becoming wholly mechanized, closer supervision is practiced. This is made possible through the greater concentration of working places when mechanical loaders are used. One mine in this field that formerly produced 1,000 tons of coal a day with 100 working places and 100 miners is now producing this tonnage

TABLE 5.—ACCIDENT RECORD FOR THE YEAR 1937 IN THE SCOTTS RUN AND MAIDSVILLE DISTRICTS COMPARED WITH ENTIRE STATE OF WEST VIRGINIA

	Fatal Accidents	Tons per Fatal Accident	Non-Fatal Accidents	Tons per Non- Fatal Accident
Scotts Run and Maidsville Districts .....	15	305,453	348	13,166
West Virginia .....	367	324,155	14,862	8,005

with 10 working places, using mobile coal loaders. As all machine loading crews are under the supervision of a shift boss, it is now possible to obviate the carelessness on the part of the miners to a large extent, and this will undoubtedly lower the accident rate of the entire field.

To sum up the effect of mechanization on safety, it might be said that the operators in this field are convinced that the successful operation of mechanical loading requires good management, careful layout of the method

and cooperation of the workmen, all of which are conducive to safety.

#### Outlook for the Field

This will be an important producing field for many years to come. The rail and river shipping facilities offer a convenient outlet for thousands of acres of virgin coal land that adjoin the present field, extending westward beyond Cassville and northward into Greene County, Pa. New developments are already in progress to open these new fields, so that greater tonnages of coal will probably be shipped from this district in the future than during its greatest boom periods.

The mines are constantly improving technique in the mining of coal mechanically, which is increasing the output per worker. Experimental work with larger mine cars and better systems of mining are producing noteworthy results and are encouraging further modernization of all the mines in the field. The faith of the operators in the future of the coal business is reaffirmed by the continual new capital expenditures they are making to modernize their plants still further and keep abreast of the keen competition which always faces them.



A recent installation of a Jeffrey 8-ft. Aerodyne fan in the district

of mining, suitable and adequate equipment, and intelligent supervision



Cargo of coal being shipped from the Morgantown and Pittsburgh Coal Dock Company



# Bureau of Mines Midget Impinger Dust Sampling Apparatus<sup>†</sup>

THE impinger<sup>1</sup> was developed at the Bureau of Mines in cooperation with the United States Public Health Service in 1922 during the course of an investigation of dust-sampling instruments in common use at that time. The apparatus has been widely used in most of the work done in this country. Also, results obtained by this method have been used in correlating the clinical manifestations and pathological changes with dust concentrations in the air and in establishing permissible limits of air dustiness.

Owing to the fact that permissible limits have been established in this country on the basis of impinger results and that it has proved difficult to design a simpler method that will give comparable results, the impinger method has been accepted as the standard in this country.

While satisfactorily used in conducting many surveys and in laboratory studies there are disadvantages in the use of the large impinger, particularly its bulk, weight and power requirements. The suction apparatus was originally designed to be hand-operated, but considerable effort was required to operate it. The electrically driven suction device or compressed-air ejectors later used with the apparatus required a source of electricity or compressed air and the necessary connections and extension of supply lines.

A number of devices that are simpler in operation have been suggested for the determination of atmospheric dust. As the results obtained were not comparable to those of the impinger, these instruments

## • *Compact, Portable, Easily Hand-Operated Apparatus Recently Designed Yields Results Comparable With Those Obtained From Large Bulky Apparatus in Past*

have not received wide application, except possibly for preliminary surveys and routine control purposes.

To overcome the objections to the use of the large impinger and obtain results that would be comparable with it, a small impinger, designated "midget," was designed.<sup>2</sup> It is self-contained and easily hand-operated, and the entire outfit including nine impinger tubes in a convenient case need not weigh more than about 10 lbs. Although designed to be hand-operated, a self-contained unit operated by a spring or electric motor may be built.

By H. H. SCHRENK  
Chief Chemist, Health Division  
Bureau of Mines

size, otherwise individual calibrations are necessary. The orifice (1 mm in diameter) was made by drawing the tube to a point and controlling the size of the opening with a steel mandrel. As shown the flask is sealed for transportation; the seals are, of course, removed during sampling.

### Description of Midget Impinger

The midget impinger is identical in principle and similar in design to the large impinger (see Fig. 1, showing comparative size of the two instruments). The difference is only in size and the fact that the midget impinger operates at a pressure drop of 12 in. of water as compared to 36 for the large impinger.

The midget flask is about 11.5 cm long and 2.5 cm in diameter. It has a side arm 1 cm in diameter, tilted upward at an angle of 45° to facilitate dilution and cleaning. It is graduated at 5-ml intervals for a total of 30 ml. A mark at a point 5 mm from the bottom serves as a guide for setting the nozzle of the impinger tube at the proper distance from the bottom. The impinger tube is 15.2 cm long, 5 mm O. D., and has a 1-mm orifice. Four projections on the tube near the lower end aid in holding it centrally in the flask, a desirable but not essential feature. The nozzle is an important part of the impinger, and must be uniform in

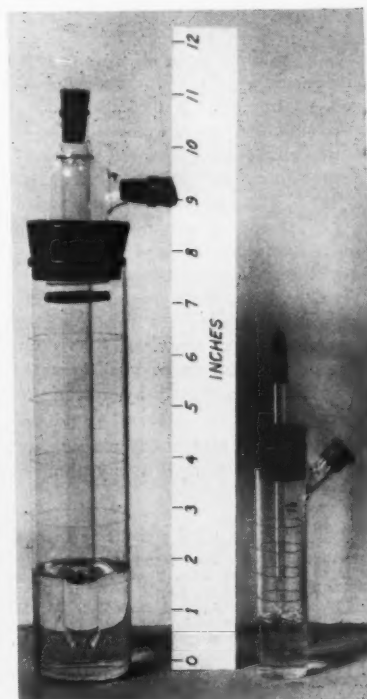


Fig. 1. Large and midget impingers

<sup>†</sup> A contribution from the Central Experiment Station, Bureau of Mines, Pittsburgh, Pa. Published by permission of the Director, Bureau of Mines, United States Department of the Interior. (Not subject to copyright.)

<sup>1</sup> Greenburg, L., and Smith, G. W. A New Instrument for Sampling Aerial Dusts. Bureau of Mines Report of Investigations 2392, Bureau of Mines, 1922, 3 pp.

<sup>2</sup> Littlefield, J. B., Feicht, Florence L., and Schrenk, H. H. The Bureau of Mines Midget Impinger for Dust Sampling: Report of Investigations 3360, Bureau of Mines, 1937, 4 pp.

Figure 2 shows the complete midget-impinger sampling apparatus in position for sampling. The case is open to show the pump, accessories and eight extra impingers. A gage in the top shows the pressure at which the apparatus is operating. One end of the case is hung from the operator's belt by a hook, and a strap passing in back of the operator's neck supports the other end. Another, and probably more comfortable, arrangement would be to use two straps and attach them to a shoulder harness. The impinger is connected to the suction apparatus by a piece of 1/4-in. rubber tubing. It is then put in the small holster and placed at the sampling point.

When not in operation the strap may be fastened at the ends of the case and used in carrying the apparatus.

### Description of Pump

Figure 3 is a diagrammatic sketch of the impinger assembly. The purpose of the surge tanks is to smooth out variations in rate of flow of air. The second tank connects to a gage graduated to 30 in. of water vacuum and to the impinger. Sixty revolutions of the crank gives a smooth flow of 0.1 cubic ft. of air per minute through the impinger with a 1-mm orifice, when operating at a pressure drop of 12 in. of water.

The pump shown in Figure 3 was designed<sup>3</sup> especially for use with the midget impinger and was found to give excellent performance. It has four cylinders disposed radially at 90-degree intervals about a single-throw crank. The intake valves connect to a collector ring which in turn connects through the surge tanks to the impinger. The pump may be lubricated with graphite grease, one lubrication being adequate for collecting several hundred samples. The pump was constructed to be hand-operated, but can be operated by electric or spring motor.

The first midget impinger was equipped with a small rotary pump of

the vane type, and this also gave satisfactory performance. Several companies plan to manufacture the midget impinger, and probably various types of suction devices will be made available.

### Counting Midget-Impinger Samples

Midget-impinger samples are counted essentially as are samples collected with the large instrument; that is, the microscopic technique<sup>4</sup> or the microprojection procedure<sup>5</sup> which gives the same results, eliminates eye strain and makes counting somewhat more rapid.

The midget-impinger flask is filled to the 10-ml mark with the collecting liquid for sampling. The suspension obtained is diluted to a suitable volume, 10 to 30 ml, to obtain a proper concentration of the suspension for easy counting.

### Results of Tests

The midget impinger was compared with the large impinger in the laboratory. Concentrations of silica dust ranging from 0.5 to 30 million particles per cubic foot were prepared in a dust chamber. Simultaneous samples were then taken by the large impinger and by two midget impingers. One of the midget impingers was all-glass and was operated by the laboratory suction system; the other was equipped with Neoprene and rubber stoppers

and was operated by a hand-cranked suction device. The purpose of the all-glass apparatus was to eliminate errors owing to possible contamination from stoppers. Contamination from stoppers was overcome by using synthetic rubber stoppers of material sold as Neoprene for closing the neck of the flask. For closing the side arm, a size 1 red rubber stopper known as Noair was found to be satisfactory.

Particle size measurements (microprojection technique) on dust samples collected in the chamber by a thermal precipitator showed a geometric mean of 0.6 micron and a standard geometric deviation of 1.9. Table 1 shows results of the tests. The concentrations found; the ratios between the all-glass and the large impinger, (G/L ratio); the ratios between the hand-cranked midget impinger and large impinger, (H/L ratio); and the ratios between the all-glass and hand-cranked midget impingers (G/H ratio) are given. The results of these tests show that the midget impinger checked the large impinger generally within 10 percent, a variation that might be expected in comparing two large impingers.

TABLE 1—COMPARISON OF MIDGET IMPINGER AT 12-IN. HEAD OF WATER WITH LARGE IMPINGER.

Concentration, millions of particles per cubic foot						
Large L	All-glass midget G	Hand-cranked midget H	G/L	H/L	Ratios G/H	
30	29	28	0.97	0.93	1.03	
20	20	19	1.00	.95	1.05	
11.4	13.1	10.6	1.15	.93	1.24	
7.9	8.1	8.0	1.02	1.01	1.01	
6.1	7.1	5.8	1.16	.95	1.22	
1.55	1.64	1.62	1.06	1.05	1.01	
1.14	1.31	1.06	1.15	.93	1.24	
.55	.55	.56	1.00	1.02	.98	
.47	.48	.42	1.02	.89	1.14	
Mean value			1.06	.96	1.10	

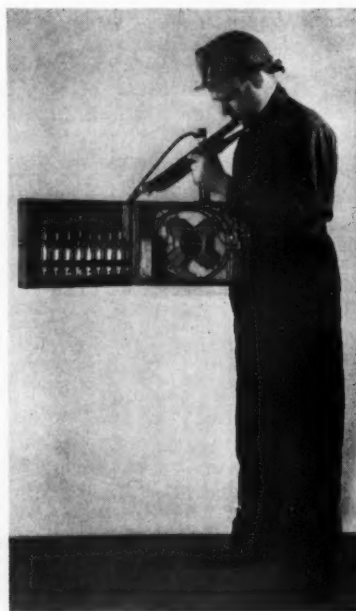


Fig. 2. Midget impinger sampling apparatus

Comparative tests were next conducted during rock-drilling experiments in hard and weathered Catocin greenstone in the Test Adit of the Mining Division of the Bureau of Mines at Mt. Weather, Va. Table 2 gives the results of 20 tests in which simultaneous midget and large impinger samples were taken. The samples were collected during wet drilling with the exception of the last three which were collected while dry drilling. The results obtained with the large and midget impingers were of about the same magnitude. Several of the results with the midget im-

<sup>3</sup> Littlefield, J. B., and Schrenk, H. H. Dust Sampling with the Bureau of Mines Midget Impinger, Using a New Hand-operated Pump. Bureau of Mines Report of Investigations 3387, 1938, 4 pp.

<sup>4</sup> Bloomfield, J. J., and DallaValle, J. M. The Determination and Control of Industrial Dust. Public Health Bulletin 217, April 1935, 167 pp.

<sup>5</sup> Brown, C. E., Baum, L. A. H., Yant, W. P., and Schrenk, H. H. A Microprojection Method for Counting Impinger Dust Samples. Bureau of Mines Report of Investigations 3378, 1938, 9 pp.

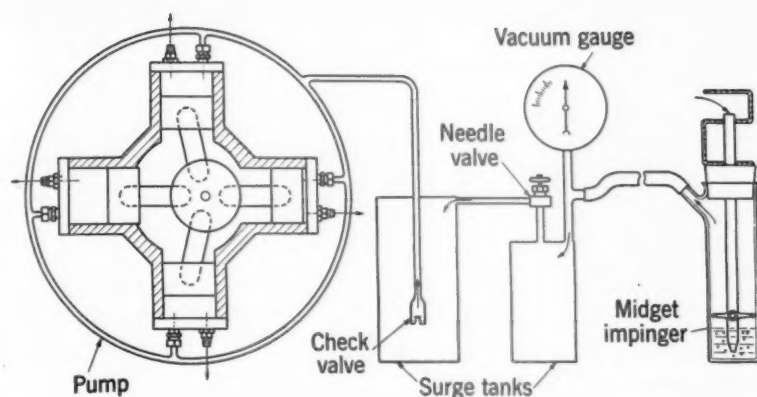


Fig. 3. Diagrammatic sketch of midget impinger assembly

TABLE 2—COMPARISON OF LARGE AND MIDGET IMPINGER DUST COUNTS. DUST DISSEMINATED BY PNEUMATIC DRILLING IN CATOCTIN GREENSTONE.

Sample	Count, millions of particles per cubic foot Large impinger	Count, millions of particles per cubic foot Midget impinger	Ratio, large/midget results
1	8.0	10.0	0.80
2	6.5	6.0	1.08
3	4.2	3.0	1.40
4	10.0	7.0	1.43
5	7.8	10.0	.78
6	29.5	25.0	1.18
7	6.8	9.5	.72
8	17.5	13.5	1.30
9	9.5	8.0	1.19
10	10.2	14.0	.73
11	8.5	8.0	1.06
12	3.2	7.5	.43
13	5.2	4.0	1.30
14	9.2	8.0	1.15
15	19.5	6.5	.89
16	5.8	6.5	.89
17	5.2	5.0	1.04
18	740.0	730.0	1.01
19	165.0	140.0	1.18
20	1,450.0	1,550.0	.94
Average			1.03

pinger were somewhat lower than the large impinger for low concentrations of dust. As samples were collected for only a 5-minute period the amount of dust collected was small. Under such circumstances a small error in counting may cause a large percent error in the final calculated result. Samples collected for a period of 15 minutes undoubtedly would have increased the accuracy for each impinger.

Table 3 gives additional results that were obtained by a Bureau engineer who used the midget and large impingers during an investigation in which drilling was done in siliceous schist. These samples were collected over a period of 15 minutes, and it will be observed that even though the concentrations were very low, the agreement was as good as could be expected from two large impingers.

\* Littlefield, J. B., Feicht, Florence L., and Schrenk, H. H. Efficiency of Impingers for Collecting Lead Dusts and Fumes. Bureau of Mines Report of Investigations (in press).

TABLE 3—COMPARISON OF LARGE AND MIDGET IMPINGER DUST COUNTS. DUST DISSEMINATED BY PNEUMATIC DRILLING IN SILICEOUS SCHIST.

Sample	Count, millions of particles per cubic foot Large impinger	Count, millions of particles per cubic foot Midget impinger	Ratio, large/midget results
1	3.7	3.9	0.95
2	1.8	2.1	.86
3	1.6	1.7	.94
4	8.1	8.2	.99
5	7.5	7.9	.95
6	4.9	4.5	1.09
7	3.3	2.9	1.14
8	2.3	2.5	.92
9	2.3	2.2	1.05
10	10.2	10.8	.94
11	14.5	15.2	.95
Average			.98

Recent tests<sup>a</sup> by the Bureau have indicated that the midget impinger is also satisfactory for collecting lead dust to be determined chemically.

#### Summary

A small impinger called midget has been designed. This apparatus is compact, readily portable and easily hand-operated. Results obtained on silica dust, Catoctin greenstone and siliceous schist agree well with the results obtained with the large impinger when counting by the lightfield technique. Tests also indicate that the midget impinger satisfactorily collects lead dusts to be determined chemically. A simple, compact and positive-acting pump designed by the Bureau of Mines is also described. The apparatus is to be made commercially available.

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# MAIN HAULAGE SIGNAL SYSTEM At Koppers Powellton No. 5 Mine

- **Effective in Providing Safe, Speedy and Economical Main Line Transportation**

By A. HIRAM SHAFER

Assistant Division Superintendent  
The Koppers Coal Co.  
Powellton, W. Va.

AT PRESENT the brain power of the mining industry is being highly concentrated on a single subject which calls for probably the greatest contribution of all times, that of devising and effectuating new mining methods with their associated ways and means to deliver coal on the sidetrack at a reduced production cost.

It is well, therefore, to consider that to obtain a full measure of success from these new methods adopted, which usually require the approval of moderate to heavy capital expenditures, it is also essential to provide a safe, speedy, and economical main line transportation system. An automatic

signal system designed to protect, regulate, and speed up the main line haulage, as well as reduce the peak-load demand, has recently been installed in our Powellton No. 5 mine,

trips from either Vulcan or 8th Right enter the first block of the automatic system and leave their manually operated signals on approaching this junction.

The first block is for the protection of loaded trips on No. 1 Main only. These trips, continuing up the No. 1 Main, approach the second block near the junctions of 12th Left and 13th Left with No. 1 Main. The end of the first block and entrance to the second block is set some 500 ft. back of the junction for visual reasons.

Empty trips leave No. 1 Main at 12th Left for No. 2 Main to either 8th Right or Vulcan. About 100 ft. from 12th Left is the junction of 13th

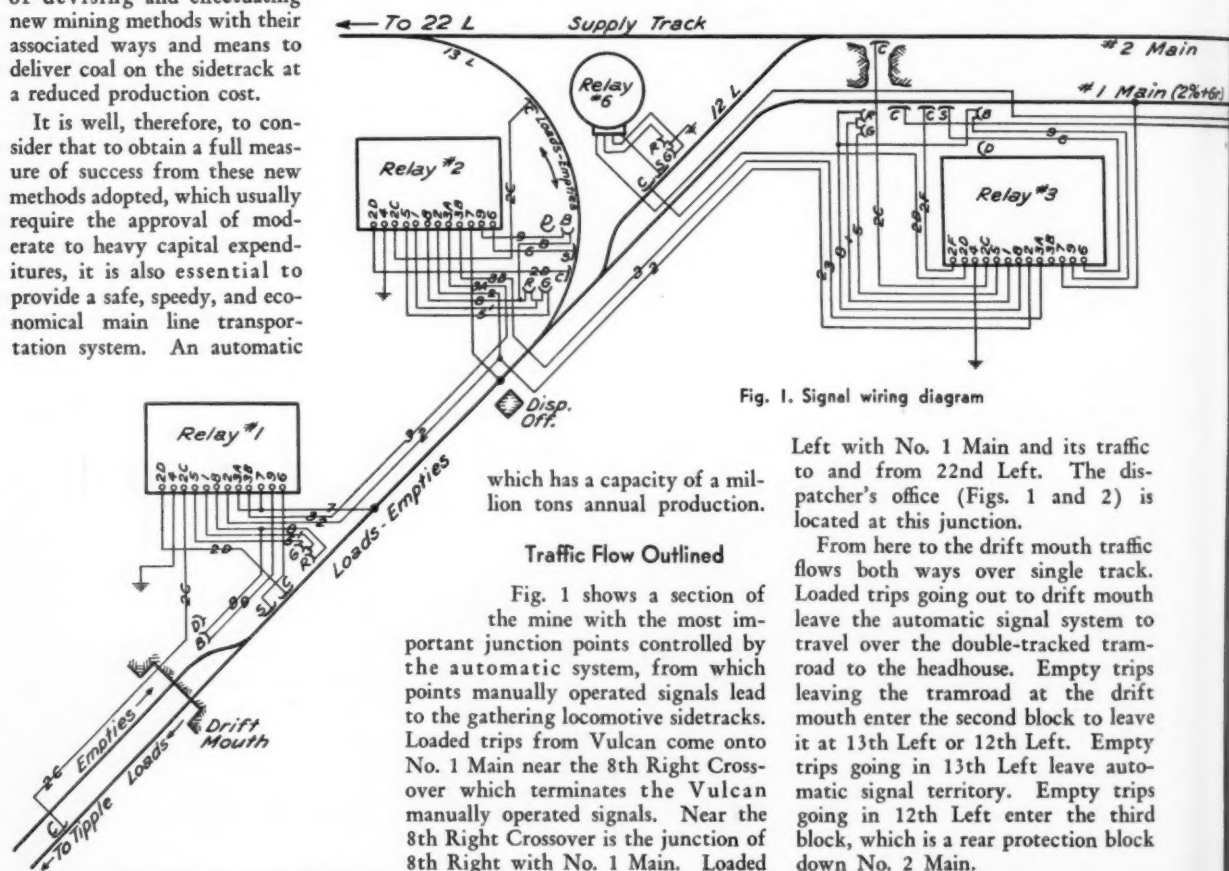


Fig. 1. Signal wiring diagram

which has a capacity of a million tons annual production.

## Traffic Flow Outlined

Fig. 1 shows a section of the mine with the most important junction points controlled by the automatic system, from which points manually operated signals lead to the gathering locomotive sidetracks. Loaded trips from Vulcan come onto No. 1 Main near the 8th Right Crossover which terminates the Vulcan manually operated signals. Near the 8th Right Crossover is the junction of 8th Right with No. 1 Main. Loaded

Left with No. 1 Main and its traffic to and from 22nd Left. The dispatcher's office (Figs. 1 and 2) is located at this junction.

From here to the drift mouth traffic flows both ways over single track. Loaded trips going out to drift mouth leave the automatic signal system to travel over the double-tracked tramroad to the headhouse. Empty trips leaving the tramroad at the drift mouth enter the second block to leave it at 13th Left or 12th Left. Empty trips going in 13th Left leave automatic signal territory. Empty trips going in 12th Left enter the third block, which is a rear protection block down No. 2 Main.

### Unique Blue Signal Light Indicates Clear Approach

The signal indicators are of the familiar color-light variety with a red for "stop," green for "proceed," and a blue indicating a clear approach. This intense blue approach light is unique in mine signaling. Motor runners particularly appreciate this feature, indicating the block is clear and in working order. Contrast this with a motor runner's uncertainty on approaching a dark signal. Signal light boxes (Fig. 3) are independent of relay cases, and while a small amount of additional wiring is required, this arrangement permits the placing of the lights in the most advantageous position for vision, obviously of prime importance.

The directional contactors are of the double trolley brush contact type in which sequence of operation establishes direction. This contactor is practically indestructible and entails little maintenance. Only one

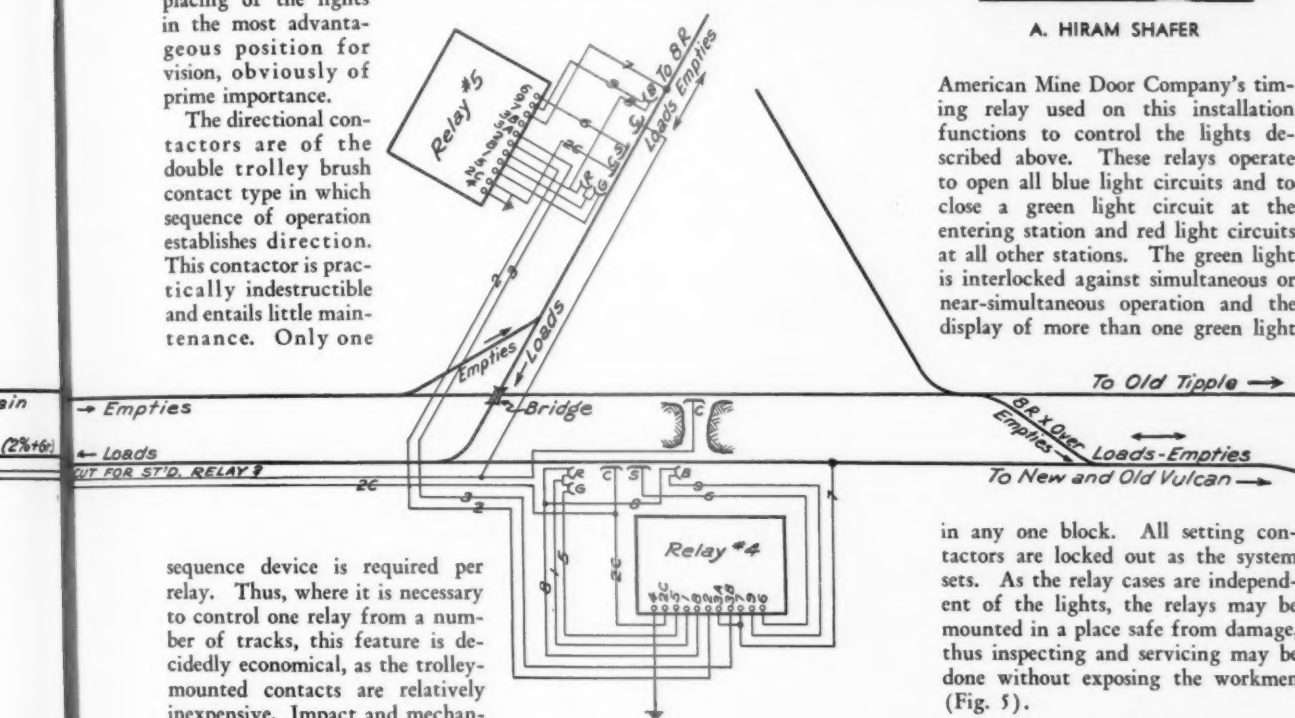
occupied would have its lights cleared by the pusher when the halted trip finally entered the block. This adaption invests all signal control in the leading locomotive and none in the pusher. In other words, the signals are operated by the first locomotive regardless of the number of locomotives in the trip.

This was the most difficult part of the system to devise and I wish to give due credit to The American Mine Door Company for their assistance in meeting satisfactorily this unusual signal requirement. This was accomplished by delaying the final operation of the relay and using a contactor as



A. HIRAM SHAFER

American Mine Door Company's timing relay used on this installation functions to control the lights described above. These relays operate to open all blue light circuits and to close a green light circuit at the entering station and red light circuits at all other stations. The green light is interlocked against simultaneous or near-simultaneous operation and the display of more than one green light



sequence device is required per relay. Thus, where it is necessary to control one relay from a number of tracks, this feature is decidedly economical, as the trolley-mounted contacts are relatively inexpensive. Impact and mechanically operated devices are entirely eliminated (Fig. 4). Power circuits in the relay are protected against "feed back" to the locomotive and consequent fuse blowing in case the shoe or wheel momentarily leaves a rough trolley wire while in contact with the contactor.

### Delayed Operation of Contactors Possible

A very interesting adaption of these contactors permits a delayed operation of the relay to suit special conditions. In the Powellton installation it was necessary to delay the clearing of the system to permit certain trips with a second locomotive pushing to be entirely clear of the block. Otherwise, a trip halted while block is

a positive method of clearing the system at the proper time.

The relay is, of course, the nerve center of any signal system. The



Fig. 2. Dispatcher's office

in any one block. All setting contactors are locked out as the system sets. As the relay cases are independent of the lights, the relays may be mounted in a place safe from damage, thus inspecting and servicing may be done without exposing the workmen (Fig. 5).

### Accurate Relay Timing Makes Tail of Trip the Contactor

As the relay at the entering station operates, the timing cycle begins. This cycle is easily adjusted over an extended range. Its purpose is to limit the time the green light is to be displayed. In the Powellton installation, relays were timed for 12 seconds which normally permits the tail end of the trip to be the contactor. At the end of the timing cycle the green light is automatically replaced with a red indication, making all indications for the block red, remaining so until the block is eventually cleared. Following movements are thus prevented.

There are two trunk wires connect-



Fig. 3. Signal light box

ing the relays in a block. Although No. 14 wire is sufficient for the signals, No. 10 was used for mechanical reasons. This was hung on double porcelain insulators mounted on the roof (Fig. 6). At junction points with low roof, wire was placed in conduit to avoid damage by trolley poles jumping trolley frogs.

#### Operation of System

A trip leaving manually-operated signal territory in either 8th Right or Vulcan approaches the first block of two stations, controlled by relays No. 4 and No. 5 (Fig. 1). With a

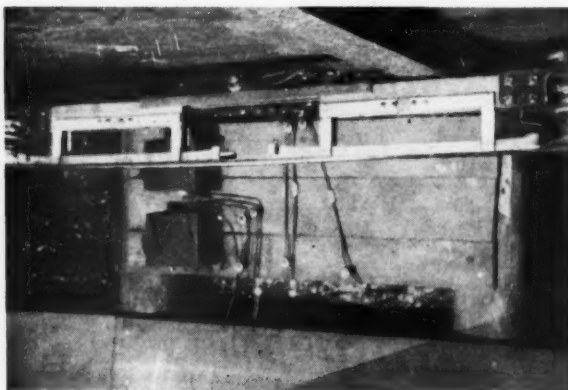


Fig. 4. Directional trolley contactor

blue light the motor runner passes under the directional contactor and receives a green indication ahead showing he "has" the block. Simultaneously the other relay in this block sets a red indication. At the end of

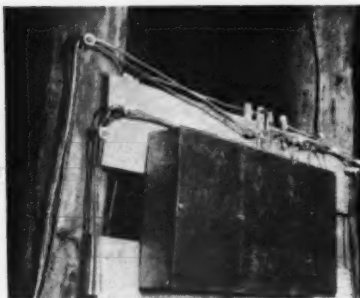


Fig. 5. Relays are housed in aluminum cases

12 seconds, as he proceeds on No. 1 Main, the green light is replaced by a red to hold any following trip until he clears the block.

As he approaches the next block, an unrestricted view of the signals at relay No. 3 may be had for approximately 1,000 ft. As he cannot clear the block he is traversing until he has entered the next block, a red light stopping him at relay No. 3 will leave his signals set at relays No. 4 and No. 5. When the red light at relay No. 3 is replaced by a blue he proceeds, setting a green light here and reds at relays No. 1 and No. 2. He now has a clear route to the drift mouth.



Fig. 6. Signal wires are strung from roof along center of track

After 12 seconds, a red light is set at relay No. 3, forestalling a following movement he has permitted by clearing relays No. 4 and No. 5. As he leaves the drift mouth, he passes under the primary contactor at relay No. 1 operating the delayed cut.

The signals, however, are not restored until he passes a secondary contactor farther on, his pusher motor, if any, having no effect on either contactor.

Returning with empties the motor runner enters the automatic system at the drift on a clear signal, setting a green for himself and reds against the loads from No. 1 Main and 13th Left, and proceeds on No. 1 Main into 12th Left. Here he faces a single relay block indicating red if an empty trip is ahead of him in No. 2 Main. However, with a green indication he proceeds, setting this signal at red and also operating the primary delayed cut contactor for relays Nos. 1, 2, and 3, which he finally cuts at the secondary delayed cut contactor in No. 2 Main. The red indication in 12th

Left he restores after his trip has cleared the junction of No. 2 Main and 8th Right. He is now ready to enter manually-controlled signal territory to the working sections.

An adjunct of the automatic system comprises red lights at relays Nos. 1, 2, and 3 manually-controlled by the dispatcher. These may be used to give preference to any trip at these points by holding the others.

The relays are housed in aluminum cases (Fig. 5) to reduce deterioration by the elements. The double porcelain insulators are attached to a standard trolley hanger and clamp by using a  $\frac{3}{8}$ -in. machine bolt through the insulators and held tightly by the trolley clamp. Signal wires (No. 10 DBRC) were hung along the roof in the center of the track to keep them away from trolley or telephone wires (Fig. 6). Beyond the automatic system, manually-controlled roof switches have rubber handles (Fig. 7) and are operated at full trip speed. Signal light boxes have two lamps for each indicating signal to insure constant signal lights.



Fig. 7. A manually controlled roof switch

Electric switch throwers with color-light indicators were installed at 13th Left on No. 1 Main and 8th Right on No. 2 Main. These permit motor runners to select their route without lost time to trip or danger to trip rider. The switch thrower at 13th

(Concluded on page 51)



# Winter Air Transportation to Thunder Mountain Mine

## ● Notable Exploits in Delivering Vital Supplies by Plane to Inaccessible Central Idaho Operations

By BENJAMIN H. KIZER

Director  
Thunder Mountain Mining & Milling Company

IT WAS the proud boast of "Lightnin' Bill Jones," whom many thousands remember as the principal character in Frank Bacon's famous play, "Lightnin'", that he drove a swarm of bees across the Nevada desert, and never lost a bee. As old "Lightnin'" told this story, it invariably convulsed the theatre audience. But no one in central Idaho laughs when an apparently even taller story is told in that section by Bob Johnson, the owner and air pilot of the "Johnson Flying Service." Johnson's story is that he took his plane over Thunder Mountain, in the Salmon River mining district, last winter on his twice-a-week trips, and that from time to time he delivered eggs to the Thunder Mountain Mining and Milling Company to the number of eight cases, containing 240 dozen eggs. These cases he shoved out of his 500 hp. Travelair cabin plane, to fall 500 ft., landing on a snow-bank near the top of the mountain—and never cracked an egg! Believe it or not, as Ripley daily challenges his readers, but it happens to be true.

How did he do it? The answer may be guessed by some of our air-minded readers. The cases were let down by parachute so gently that they did not even sink into the snow-bank.

This is merely a passing incident in the many services rendered by Bob Johnson out of Cascade, Idaho, to the mining properties located at points in the Salmon River area that are inaccessible in the winter months. For the mine is like the show. It must go on. Last winter Johnson's flying service delivered approximately 150,000 lbs. of machinery for placer operations

at Mackay Bar on the Salmon River in order that placer operations could be carried on as early as possible this year.

### Thunder Mountain Camp Marooned at 8,000 Feet Half the Year

But the mine that receives the most benefit from Johnson's airplane is the property of the Thunder Mountain Company, located near the summit of Thunder Mountain, in Valley County, Idaho, a hundred miles northeast of Cascade, its nearest supply point. The company's mining camp, at 8,000 ft. elevation, is marooned by heavy snows for six or seven months of each year. Hence, each fall it must lay in its supplies for the winter. It is not possible to establish a winter landing field near the mine, and fresh vegetables, fresh eggs and emergency supplies must come in by airplane, or not at all. These supplies must be dropped at the clearing in the trees nearest the mine. From here the mining company's dog-team carry them to headquarters.

One other contact with the outside world was maintained by this partnership-in-service of the dog-team and the airplane. The company has been shipping its gold produced from its operations, all this first winter, by dog-team from the mine to Stibnite, 20 miles away, where a landing field enabled the plane to pick it up and carry it to the nearest rail point at Cascade, 75 miles farther on.

Figs. 1, 2 and 3 (top to bottom). Delivering heavy pump by airplane and parachute





Fig. 4. Dog team used to transport equipment from where it landed to pump house

#### Camp Visited Twice a Week by Plane

Twice a week all last winter this mining camp was visited by the Johnson airplane, which dropped its packages containing U. S. mail, mine and mill repairs, and smaller equipment. On one of these trips Johnson delivered to the Thunder Mountain Company a complete 2-in. x 1½-in. SS-MH centrifugal pump with 7½-hp. 3,500 r.p.m. seal-clad motor and starting equipment, manufactured and shipped by the Allis-Chalmers Company, from its Norwood Works at Cincinnati.

The Allis-Chalmers Company did not place its whole confidence in Johnson's 14-ft. parachute. The pump and motor were first carefully wrapped in paper and covered with burlap bags. This was then put into a box with a great deal of excelsior closely packed—the packed box weighing 450 lbs. The starting equipment was packed in a separate box in like manner, and weighed 150 lbs. But so well did the pilot adjust the parachutes to the weight they carried that the two boxes merely sank about 2 ft. into the snow and their contents arrived in perfect condition.

Fig. 1 shows the plane circling the landing place, preparatory to dropping the pump; Fig. 2 reveals the pumping equipment just after being ejected from the plane with the parachute just opening—the visible speck being the pump. Fig. 3 shows the parachute wide open as it was about to drop its burden. The dog team shown in Fig. 4 is the one used to transport the

equipment from where it landed to the pump house. The dark cave-like opening in Fig. 5 shows the entrance to the pump house; the amount of snow encountered on these mining properties is strikingly apparent. It was not until a number of months had elapsed after delivery of the pump that these pictures were able to find their way back to civilization.

Sometimes in delivering the mail, it seemed to the watching miners below as though the plane barely skimmed the tops of the trees. But at the time the heavier packages were delivered, to give the parachute time to open and become fully effective, they were dropped at an elevation of several hundred feet above their landing place.

#### Summer Transportation by "Paul Bunyan's Roller Coaster"

A good Forest Service road, recently built, serves to connect the Thunder Mountain mine with the outside world, and during the summer months supplies of all kinds are daily delivered to the mine by motor truck. Incidentally, this Forest Service road needs to be traveled on to be appreciated. It ascends from stream crossing to summit four times. The summits range from 7,000 to 8,000 ft. above sea level and the stream crossings are from 2,500 to 3,000 ft. below the summits. The road has been called "Paul Bunyan's Roller Coaster" in honor of its steep grades, its abundance of switch-backs and its hair-pin curves. It is opined that Paul could take it all right, but that Paul's blue ox would get pretty dizzy on the fiftieth switch-back.

During the summer and fall, when the mines are not dependent on the air service, Johnson's plane is engaged in transporting hunting parties, since this territory is one of the finest game preserves in the United States. Johnson carries supplies, too, for the United States Forest Service to those engaged in fire fighting and to remote observation points.

#### Historic Sketch of Thunder Mountain Operation

Thunder Mountain was the scene of a gold rush beginning in 1901. In the following year it is stated that 5,000 people participated in the rush, during which time a large amount of

(Concluded on page 51)



Fig. 5. Entrance to pump house through snow tunnel—illustrates heavy snowfall at property

# Mining a 40-Foot Bed of Anthracite on 45° Dip

- **Use of Rock Gangways Permits 75 Percent Recovery and 310 Tons Marketable Coal per Lineal Foot of Gangway**

By D. L. FREILER

Superintendent  
The Philadelphia & Reading Coal & Iron Co.  
Pottsville, Pa.

THE Mammoth vein is being mined in and close to its basin at the Gilberton colliery in the anthracite district of Pennsylvania, and averages about 40 ft. in thickness, with a variance from 36 to 60 ft. It consists of a hard, bright anthracite coal, laminated with two and sometimes three bands of slate varying from 3 to 12 in. in thickness. Very little bone appears in the vein. The strike of the vein runs in a general east-westerly direction and dips towards a common basin, averaging about 45° northward and approximately 50° southward from the outcroppings.

The physical structure of the vein is fairly constant in its degree of hardness, but several of the benches of coal in it do not maintain a regularity in hardness of structure. At times the lowest bench of about 12 ft. in thickness is so hard that it cannot be mined without considerable blasting, while in other places the same conditions prevail in the bench of coal lying along the top of the vein. The structure of the other benches of the vein is also variable and, at times, is inclined to run ahead of the developments.

The roof is a friable slate which breaks very easily, and constant care

must be taken in removing the coal to avoid an excessive dilution of slate.

The virgin mining, as stated, is along or near the basin of the vein, which is at an elevation of minus 66. The covering in the center of the basin is 1,200 feet; this heavy covering is reflected in the amount of timber required in the several types of mining. Elevation of the vein at the north dipping outcrop is 1,380 feet, and at the south dipping outcrop it is 1,205 feet.

The vein generates gas, but no difficulty is experienced in ventilating the mines. Two fans of 100,000 c.f.m. capacity each operate under a force system with a water gauge of 1.8 in.

## Haulage Ways in Rock

The haulage ways, commonly known as gangways, are located in rock from 60 to 80 ft. under the Mammoth vein. At times it has been found necessary to place timber supports in these rock gangways, but as a general rule timbering is not required. The haulage ways are driven on a plus 0.5 percent gradient, and are 10 ft. wide and 8 ft. high. This allows ample room for

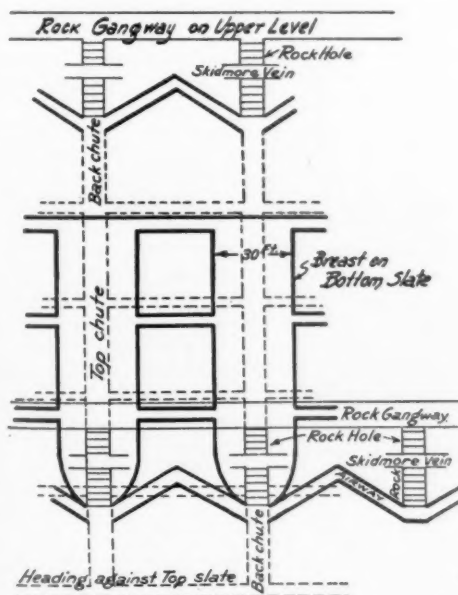


Fig. 1. Plan of Mammoth vein breast and top chute

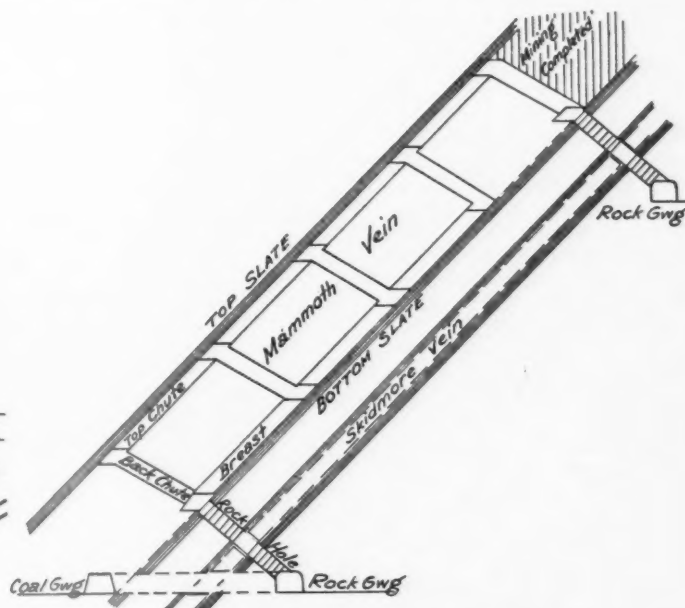


Fig. 2. Cross section of Mammoth vein breast and top chute



ventilation, drainage, and transportation. Extra excavation is required for necessary timbering.

The Skidmore vein, about 7 ft. in thickness, lies between the rock gangway and the Mammoth vein, and is sometimes used to recover Mammoth vein coal which may have been lost on account of falls or by reason of the vein running away.

#### Rock Holes, Then Airways Driven

Rock holes are driven to the Mammoth vein from the rock gangway at 60-ft. intervals on a pitch of 40°. They are 8 ft. wide and 6 ft. high. All of the coal from the Mammoth vein gravitates through the rock holes and is loaded into mine cars on the rock gangway (see Figs. 1 and 2 and refer to them as method is further described).

When the driving of two or more rock holes has been completed to the Mammoth vein, airways are driven from one to the other. The procedure is to start from the top of each rock hole and drive the airway along the bottom slate of the vein on a rise of about 25°, connecting at a central point. This allows the coal from the pillar holes, which are driven at a later date, to run down the slant airway to the rock hole for loading. The airways are 36 to 40 sq. ft. in area and are timbered with two-piece sets, known as post and bar. The post and bars are 6 in. in diameter and 6 ft. and 7 ft. in length, respectively. No. 20 gauge sheet iron is used in the slants.

After the airways have been connected and ventilation established, a back chute is driven on line with the rock hole on a pitch of 30° to the top of the vein. Connecting airways are then driven horizontally along the top slate of the vein and ventilation established. Post and bars are used in the timbering of the airways.

#### 10-ft. Chutes up Pitch Along Top Slate Followed by 30-ft. Breasts Along Bottom Slate

Chutes, 10 ft. wide, are then driven up the pitch along the top slate and connected to an upper level. At 60-ft. intervals along the chute a heading is driven to an adjoining chute. This eliminates the necessity of returning the ventilation from the face of the chute any great distance. No chute is advanced more than 60 ft. from a connected heading. Three-piece timber sets of 8-in. diameter are used in the chutes, 5-ft. collar and 8-ft. spread (Fig. 3). The chutes serve the purpose of draining gas from the vein,

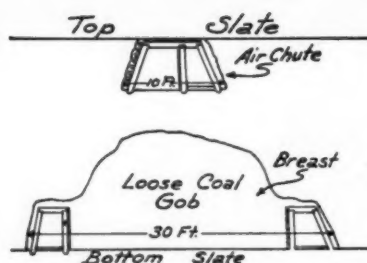


Fig. 3. Method of timbering breast and top chute

which reflects favorably on the amount of gas encountered when driving the main breasts. It also assures satisfactory ventilating conditions where the vein may be free and it is impossible to drive the breasts the anticipated distance.

Breasts are then driven up the pitch along the bottom slate of the vein. Where conditions warrant, the breasts are driven 30 ft. wide, leaving a pillar 30 ft. in width, to be mined later. As a general rule the width of the breast is limited to 24 ft. in order to drive them the required distance up the pitch. Method of timbering breasts is shown at bottom of Fig. 3.

Breast batteries must be installed before the breasts can be advanced. These consist of four sets of post and bars 12 in. in diameter and are placed along the bottom slate of the vein at the top of the rock hole (Fig. 4).

The breasts are then started 12 ft. wide and gradually increased to full width within a distance of about 24 ft. (see Fig. 1). Manways, 3 ft. wide, are maintained along each rib, leaving the remaining portion boxed with plank for the storage of coal. These boxes are known as gobs and are kept filled to the working face to enable the miner to advance his work and to insure ventilation at the face of the breast. The manways are propped into the coal with 6-in.-diameter timber at 5-ft. intervals, and couplings (three-piece sets of 4-in.-diameter timber) are

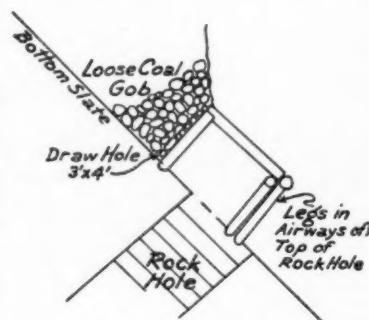


Fig. 4. Post and bar breast battery

placed above each prop to support the plank along the gob.

The coal in the manway is mined to a height of about 5 ft., but in the area within the gob the coal is loosened so that its entire thickness may fall. This produces a partial arch and assists in maintaining the manway while the coal is being drawn from the gob.

#### Back Chutes Insure Loosening Entire Vein

In order to insure the loosening of the entire vein, back chutes are driven at 50-ft. intervals and oftener when necessary. These back chutes are driven to the chutes along the top slate and then fired. Surplus coal is drawn from the gob, and the amount remaining in the gob is regulated to suit conditions. When the driving of the breast has been completed and the work of drawing the coal has begun, miners fire the supporting arches over the manways. The drawing of the gobs does not start, however, until the adjoining breast has been driven and the miners have been withdrawn from same.

The work of driving airways, chutes, and breasts is conducted on a contract yardage basis, and the loading of coal controlled by day-rate men, who are hired for that purpose.

#### Method of Drawing Pillars

After a section of first mining has been completed and the coal recovered from the several breasts, pillar holes are driven up the pitch along the bottom slate of the vein, in the center of the pillar and as far as conditions permit. Since these pillars are the sole remaining support of the roof, it often results in a certain amount of crushing of the coal, which hinders the driving of the pillar hole, through the entire length of the pillar. When this condition is encountered, chutes are driven in the underlying Skidmore vein. Rock holes are then driven and the remaining coal recovered from the Mammoth vein.

The driving of pillar holes is somewhat similar to the driving of breasts, except that they seldom exceed 12 ft. in width and are driven with one manway when the pitch of the vein does not exceed 40°. It is not necessary to drive chutes along the top slate, similar to those driven above the breasts.

This system of mining from rock holes from a rock gangway leaves a lift of from 60 ft. to 80 ft. of coal between the gangway level and the

(Concluded on page 51)

# THE RELATION OF MINES TO FORESTS\*

OF THE great number of natural resources with which our State was endowed, the first to be developed was the fur trade in the early part of 1800. By the very nature of its business the population of this class was nomadic. A few transient trading posts was all it contributed to the development of the State.

The arid valleys and plains did not appeal to the few agricultural minded who crossed the State near the middle of the century. They pushed on to the west coast where the abundant rainfall insured a crop, for irrigation had not as yet come into the picture of American farm life except in a few isolated places.

It remained for the miners to establish the first permanent settlements and social and political organizations. The early day miner of the west, like the trapper, had to be a self-reliant, self-sustaining individual, but the nature of the resources pursued made of him a more permanent individual. The miner's search was for the frozen asset concealed underground. The trapper pursued the nimble footed fur-bearer over the earth's surface.

## Farmers Followed the Miners

Once the mining communities were established the agriculturist came in to supply their needs for food, so that the two forms of development were nearly coincident.

It took some time under the methods of transportation and communication for the territorial machinery of government to catch up with the sudden influx of population, and until it could be organized each community set up its own. Many of the rules and practices governing mining and use of water have since been written into our statutes.

The raising of livestock was the leading agricultural activity until the passage of the Carey Act encouraged the building of larger and more elaborate irrigation projects at the be-

\* Presented to Annual Meeting of Idaho Mining Association, Boise, Idaho, March 12, 1938.

## • *United States Forest Service Has Endeavored to Handle Problems Equitably in Spirit of Cooperation*

By G. B. MAINS

Forest Supervisor  
Boise National Forest

ginning of the century. The building of two railroads across the State in the '80s had brought many new homeseekers from the eastern farming populations where homestead lands were getting scarce.

The prairie States were being settled at the same time and this brought on a demand for lumber from the magnificent forests that clothed the mountains, and the lumber industry developed rapidly from 1890 on, to supply the local and export demand.

There had been little or no conflict between the farm seeker and the prospector, since the class of land each sought differed widely in character and location, but the timber land seeker and the miner sometimes found themselves wanting the same piece of ground.

## First Forest Reserve in Idaho Created in 1897

Both the farming and mining interests needed water and timber to carry on their industry and the threat of rapid depletion of our forests on the mountain slopes spurred on by the conservation movement beginning in the eastern States caused the creation of the first Forest Reserve in the State, the Bitter Root, in the central part of the State. This was created by President Cleveland in 1897, and was administered by the Department of Interior. The area was about 4,000,000 acres.

The administration of these early forests was pretty much carried on from the National Capital at Washington and for this and other reasons

Congress in 1905 changed them over to the Department of Agriculture.

## Rapid Addition to National Forests Opposed by Mining and Stock Interests

From 1905 to 1908 many millions of acres were added to the National Forests in Idaho and other western States by President Theodore Roosevelt. The mining and stock interests became alarmed at so much area being withdrawn, and in 1909 Congress took from the President the power to withdraw any more of the public domain in the five northwestern States.

In all these National Forest creations the right of the prospector to enter, locate and operate under the laws of the State or mining district was given without restriction. Just why the mining interests became so fearful was not clear unless it was that during the first Roosevelt administration his Secretary of the Interior began to investigate the application of the land laws and unearthed some misapplications of them. Possibly some of the newly created forest officers became too officious or arbitrary. In building up an organization as hastily as was necessary to get these vast areas under administration there were bound to be some misfits. But examinations were held by the Civil Service in communities adjoining the newly created forests, and as fast as lists could be made up and ratings given, local men were put in charge of the forests and people concerned began to feel easier and less worried about how these lands would be ad-

ministered. As fast as these men showed themselves able to handle their jobs properly, more and more responsibility was given to them from the Secretary of Agriculture's office until it became possible for the local forest officer to meet the adjoining communities' needs with but an occasional reference to the Washington office for a decision.

#### **Decentralization of Forestry Work a Popular Move**

The establishment of the regional offices in 1908 and provisions for local advisory boards to work with the local forest officers still further decentralized the organization and made it more flexible and democratic rather than bureaucratic.

With the early mining background of the population it was natural that when we came to survey the areas put under our supervision, that there were numerous settlers holding land under mining locations that were no longer being mined.

Many of these claims were taken in good faith but the mineral pinched out on them and the locator had turned the arable land into a farm to minister to the needs of more fortunate prospectors in the same vicinity.

If the claim was on unsurveyed land a mining location was about the only title he could place on it, since the agricultural squatter's right would not take precedence over a mining location in a mining district.

To meet this situation the Department of Agriculture had Congress pass the Act of June 11, 1906, making it possible for forest officers to survey and classify these agricultural lands without expense to the owner, so he

could prove up and get title to his improvements. This eliminated one of the main objections. On the other hand, we found that in some instances mining locations had been used for other purposes totally foreign to the intent of the law. Such cases, where it was evident that the use had no connection with the mineral development, were contested, and the use of the land put under its proper legal status of right-of-way, power site, mill site, summer home, hotel, roadhouse, etc. This gave rise to some of the criticism that the Forest Service was hostile to mining interests on the National Forests.

Sometimes a forest grazing permittee let his stock get onto a miner's ditch or too close to his cabin, and the forest was blamed for it; but these happenings were corrected as fast as we could locate the claims, and another source of complaint was smoothed out.

#### **Forestry Communications a Real Aid to Mining**

In order to administer and protect the resources, the forest officers began at once to build trails and telephone lines into remote sections, and the miner found these developments adding to the ease, comfort and protection of his life and property. Even now the only telephone communication enjoyed by some of the more remote mining communities is over Forest Service telephone lines.

With more intensive use of the resources on the National Forests the early trails began to be changed to roads to admit cheaper and faster transportation and the miner in the vicinity of such roads found himself

able to cut costs, increase profits and secure capital for further development.

To date the National Forests in Idaho have built 1,316 miles of roads at a cost of \$7,186,000 that have helped to open up and increase mining operations. Some of the districts so helped are the Warren, Marshall Lake, Big Creek, Yellow Pine, Stibnite, Deadwood, Boise Basin, Black Warrior, Atlanta and Salmon River.

These roads have helped to increase the output and development of the mineral as well as other resources, and have made markets for the agricultural products. I believe this policy of helping to open up the undeveloped resources of the State has more than offset any restrictions imposed, and has won the thinking people of the State to the Forest Service policy of use without destruction of our renewable resources.

Local interests have always been considered in establishing any policy for the use of a National Forest resource. Sometimes it is necessary to rule against the use of a few for the benefit of the many, but that is not bureaucracy. This is but the form of majority rule of our established form of government.

Governments should be established for one purpose only: To serve the people governed, and whenever any department, bureau or branch of government fails to serve the best interests of the people, then it has failed in its function.

The Forest Service has tried faithfully to protect, develop and make available the use of the mineral as well as other resources in the National Forests. We hope such service as we have been able to render your industry merits your approval.

#### **Sunshine Milling Practice**

Ore-dressing technique as practiced at the Sunshine mine in the Coeur d'Alenes, the world's largest silver mine, was explained by W. Church Holmes, mill superintendent, at a recent meeting of the Geological Society of the Coeur d'Alenes at Kellogg, Idaho.

The metallurgy employed to cope with the silver-bearing tetrahedrite ore (a copper antimony sulphide) associated with iron pyrite and occurring in a gangue of siderite and quartzite, and to effect the maximum economic extraction of silver, was outlined in

detail. An enviable record was made by the mill last year, the tailing assay being eight-tenths of 1 oz. of silver while working on heads in excess of 40 oz.—a recovery of approximately 98 percent.

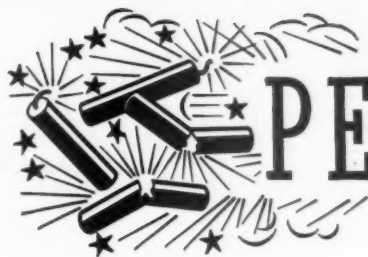
Of particular interest was his explanation of how the serious dust problem in the crushing plant, where 1,100 tons of ore per day were handled, was overcome. A new dust-collecting system, operating on the principle of a suction applied to the point of dust generation and using 10,000 cu. ft. of air per minute, filters the fine particles which might otherwise have been scattered throughout

the mill, in a specially constructed baghouse, and returns the valuable materials to the fine grinders, he said.

#### **Howe Sound Production Stepped Up**

By rearrangement of the flow sheet, eliminating several thickeners, production at the plant of the Howe Sound Company's mill at Holden, Wash., is running approximately 1,600 tons a day, and it is expected by the management that a further increase in this tonnage will be made in the near future.





# PERMISSIBLES

The President claims that more than one-third of the people are ill-housed, ill-clothed and ill-fed . . . What we want to know is the number that are ill-natured over this and that. . .

A national magazine proposed to take a poll on the subject of Government spending. . . One thing the totals may disclose is the number of people that expect to get money and the number that are going to put it up. . .

The adjournment of Congress just transfers the troubles of Washington out among the 48 states. . .

The recent stock market rise also shot up the price of a biscuit company stock. . . Could it be that some smart manipulator figures that a bread-and-water diet is going to be very popular shortly? . . .

News dispatches report that the governmental payroll in Japan was recently increased by 10,000 new employees. . . Japan always did ape its western neighbor. . .

The desire to be an actor was an obsession with Nero. . . Too bad he didn't think of starting a WPA theater movement. . .

You can't fool the Congress about who is making money. . . It cut in half a requested half million dollar appropriation to send tax agents out to coal mines to collect back taxes. . . Apparently the congressmen figured you can't get blood out of a turnip. . .

Midwestern farmers are complaining that their rye is growing too tall for a binder to be used. . . Plenty of highbinders around they could advertise for. . .

A dispatch from Japan reports that a citizen there hanged himself because he found that he had voted for the wrong candidate. . . Imagine what would happen here every other November if we took our disappointments as keenly! . . .

A recent survey shows that the new crop of college grads have bigger feet than their fathers did 20 years ago. . . But the desks to put them on have grown smaller and fewer. . .

Thirty years ago in England the law required that a man precede an automobile by 60 yards, waving a red flag to warn nervous pedestrians and horses. . . And it wouldn't be a bad idea to go back to that program for many of our drivers nowadays. . .

Now that bank loan restrictions have been relaxed, the mining operator can go to his bank and borrow money for development purposes—providing, of course, he can furnish the necessary collateral. . .

The *Congressional Record* is pretty dry reading ordinarily. . . But the gems that have appeared in the five special editions containing political records will make the year's best humor reading. . .

The Monopoly Investigation Committee is going to find that the Federal Government is a silent partner in a lot of trusts. . .

The National Resources Committee reports that poverty will probably be a chronic condition. . . Somebody must have been reading the Bible. . . We seem to remember that a greater authority than the Committee said a long time ago that the poor are always with us. . .

With all this effort to pull business out of the doldrums, it would help a lot if it is remembered that the mining industry is looking for business too. . .

President Roosevelt lighted the eternal torch at Gettysburg. . . And that's only the first of a lot of political bonfires he has set going in the last month. . .

Senator O'Mahoney insists that the monopoly investigation is not going to be a "witch hunt". . . Just the same, a lot of people are getting ready for a broomstick ride. . .

It's perfectly obvious to a lot of politicians these days that much more depends on what you say than on what you think. . .

In ancient times people erected pyramids and other monuments by which future generations would remember them. . . Future generations will remember us every time they pay taxes. . .

"Seven months in Washington is a plenty," says Vice President Garner. . . "I don't know anything about Congress and what I think isn't worth anything." . . No wonder Jack Garner is looked upon as a great man! . .

# With the COAL DIVISION

of the AMERICAN MINING CONGRESS

## STANDARDIZATION in

## COAL MINING METHODS and EQUIPMENT†

**N**EARLY twenty years ago, the American Mining Congress organized a group of Standardization Committees, and since that time the Committees have prepared a number of Recommended Standards on various mining practices and equipment that have been accepted by the American Standards Association. Many difficulties have been encountered in carrying on these studies. The fact that this movement has proceeded rather slowly has not been from lack of interest on the part of mining men, but was largely due to the complexities of mining caused by the many different sets of physical conditions that exist and by the recent changes in methods and equipment that have been brought about by the increasing use of mechanical power. The purpose of this paper is to discuss the problems of standardization in coal mining in the light of the experience that the American Mining Congress Committees have had over the past years, and to outline the studies now under way by our Coal Division.

### Advantages of Standardization

To begin with, before any form of standard can hope to merit recognition and acceptance by the coal industry, it must have the sound basis of offering some advantage to those who adopt it. The mere fact of having uniformity of procedure might in itself be sufficient to gratify advocates of regimentation and planned economy, but for the rest of us, the only

† Extract of paper presented to the Rocky Mountain Coal Mining Institute, June, 1938.

By G. B. SOUTHWARD

Mechanization Engineer  
American Mining Congress

real reason for standardization is to lower mining costs, to improve working conditions or to promote safety, and we feel that standardization is worth considering only where it does accomplish one or more of these objects.

Then there is another major point to be taken into account. Standardization is not a one-man job, and a recommendation must reflect the thought of a number of men whose combined knowledge covers all phases of the operations that will be affected—from the manufacturer to the user. A standard formulated in this way is of real practical benefit to the industry and has a much greater value than in merely setting up a uniform procedure; it represents the agreed opinion of experienced men that a certain type of material, a certain set of dimensions or a certain method of procedure is the best that has been devised so far. Of course, it must always be understood that any standard can be revised and modified from time to time as new things are invented and new methods discovered.

The fact that standardization can be effective in increasing the operating efficiency and lowering the cost of coal mining is thoroughly demonstrated by the experience of individual companies. For example, it is the usual practice within the mines of one company to adopt uniform methods

as far as practicable and to reduce to the fewest possible number the types of machines and all classes of material used. By a logical process of reasoning, it would seem that further advantages would be gained if this same procedure were applied throughout the industry, but when we begin to figure on applying standardization to a large number of mines in different fields and in different States, the problem becomes complicated.

### Difficulties Caused by Diverse Conditions

It is, of course, immediately obvious that coal mining in its entirety is not amenable to standardization. That is to say, there are so many different physical conditions as to height of seam, depth of cover, degree of pitch, character of the coal, amount of impurities in the seam, that no one type of equipment or method of mining has yet been designed that would operate with equal efficiency under all of these varying conditions. To use a mathematical term, there is no common denominator. Because of these complexities, the only method to follow in considering a program of standardization is to examine each phase separately to see how much uniformity is possible and what the advantages of such uniformity or standardization will be.

Starting first with the plan or arrangement of the underground workings, it is immediately evident that any attempt to standardize mining systems in order to bring about the adoption of similar dimensions for pillar lengths, room widths, etc., could offer little or no advantages, even if such a thing were practicable. It is further evident that it would not be feasible to standardize methods of pillar recovery because the method of pillar extraction is determined by the character of the top; and Nature has not standardized the strengths of the mine roof, the depths of cover or the types of overlying strata. Furthermore, from our present meager knowledge as to what governs the caving or subsidence over an excavated area, we know for a certainty that the subject of roof action must be given much study and scientific observation before we can forecast with accuracy what will happen when the seam is being mined out.

Operating methods seem, at first glance, to offer possibilities for uniformity, but take as an example, drilling and blasting. It is a matter of common knowledge that the number of shot holes required and the amount of explosive used depend on the height of seam, the hardness of the coal, the method of loading and the utilization by the consumer of the final product (domestic, steam, metallurgical). To formulate standard methods for drilling and shooting each height of seam and then further amplify these so as to fit the different characters of coal and their consumer uses would introduce so many permutations and combinations that the main purpose of standardization would be defeated. The same general situation exists with but a few exceptions in the other phases of mine operation. Among these exceptions are safety, and inspection and maintenance of equipment.

### Safety Rules

Safety rules covering all operating practices can be devised that are applicable to a great majority of our coal mines. The Safety Committee of the American Mining Congress is now engaged in making such a study, and this Committee, with its members covering all fields of the United States from Pennsylvania to Utah, are comparing their safety rules and regulations with the thought of correlating the best ideas into a standard. In making this study it is understood that complete standardization is not possible, because any company may

require a few additional individual rules to suit some special condition.

### Inspection and Maintenance

Inspection and maintenance of equipment is also susceptible of standardization. A definite and uniform procedure can be outlined for the inspection and maintenance of machines, haulage roads, pumps and motors, as well as electric wiring, bonding, switches, etc.,—setting forth the points where initial failure begins and giving means of correcting these before failure actually results. The increasing use of mechanical power underground is making the successful operation of the mine more and more dependent on the uninterrupted operation of the machines, and adequate inspection and proper maintenance will prevent breakdowns from occurring. The formulation of a recommended procedure will be of real practical value, and a study of this subject is now being organized.

### Equipment Standardization

Standardization of equipment has more possibilities than standardizing methods of performance, but there are also a great many difficulties in its way. Some of these can be overcome, others cannot, at least at the present time. It is true that we are already using some standards, as for example, rails, spikes and other track material, trolley wire sizes and structural steel shapes, all of which have been brought to us by industries outside of mining. We also have standard sizes and contours for mine car wheels, standard dimensions for switches and turnouts, and standard wood tie specifications which were developed by Committees of the American Mining Congress. Preliminary recommended specifications for underground power lines and main haulage track have been prepared. A report on methods of drying washed coal has been completed, and a study on coal screening is under way; both of these may ultimately lead to recommended practices.

But when we attempt to go further and talk about standard machines for loading, cutting, drilling, haulage, etc., we encounter opposition and always will. This, however, should not in any way discourage efforts for standardization in other phases of mining and should not be considered as a deterrent to progress because we know that a similar situation exists in many industries. In the manufacture of automobiles, for example, inter-

changeability does not go much beyond tires, spark plugs, lights and accessories, but this condition has not prevented the development and use of the automobile—in fact, originality and diversity of design are encouragements to progress, and any attempt to completely standardize machines for mining would prove to be more detrimental than advantageous.

### Records and Cost Accounting

Performance records and cost accounting are items for which standard methods can be designed and applied to advantage. At the present time, and especially in operations using a high degree of mechanization, there is little uniformity in the method of arriving at the costs of the different operating phases. Furthermore, there are a number of mines where (admit it or not), the management does not actually know what their true costs are. There may be much violent exception taken to this statement, but there will also be considerable confirming testimony—particularly from several companies who have attempted to make an accurate and complete cost analysis of their operation. In recognition of this condition, and to offer a correction, the Conveyor Committee and the Mechanical Loading Committee of the American Mining Congress are now both engaged in studies to develop standard methods for figuring costs and performance records for various types of mechanized loading.

### Conclusion

The foregoing discussion has attempted to outline in a general way the difficulties as well as the possibilities for standardization in coal mining. During the past few years the invention and adoption of new machines, together with the introduction of new methods, has created a situation in which standardization of certain phases of mining were impracticable. But there are still many other phases, as this outline has attempted to point out, where uniform procedure is not only practicable but would be distinctly advantageous. The experience of the American Mining Congress has shown that such a movement is well worthwhile, in correlating the ideas and experiences of mining men; and even though a complete agreement is not reached, the attempt to standardize does serve to show which practices should be discarded and which ones have proven successful.



# COAL SCREENING

A Report Prepared by the Committee on Surface Preparation

THE screening practice at a mine operating in the Pittsburgh seam is described in this report. The mined coal has a pronounced cubical fracture and is of medium hardness. The free or surface moisture content of the 0 in. by  $\frac{3}{8}$  in. coal varies from 5.3 percent to 1.9 percent, and averages about 4 percent.

## Screening Equipment and Operation

In this plant the ROM is fed at an average rate of 340 T.P.H. to a level type shaker (Unit No. 1) driven with a 12-in. quick return stroke, 72 times per minute. The shaker has three screen surfaces; 2-in. 4-in. and 6-in., in the order given. The 0 in. by 2 in. coal from the shaker goes to a vibrat-

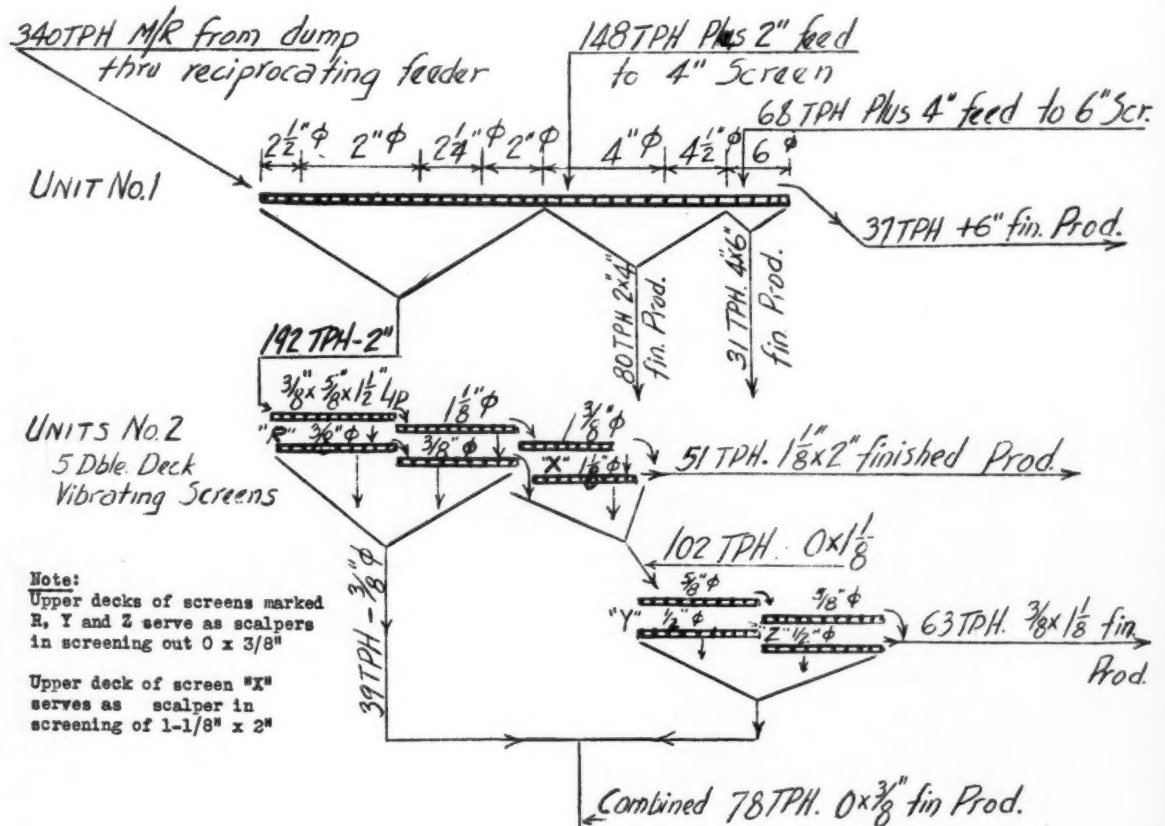
Screen Analysis of Feed Coal to Screens		
Unit No. 1—340 Tons Per Hour, Run of Mine		
Plus 6"	37 T.P.H.	10.5%
4" x 6"	31 T.P.H.	9.5%
2" x 4"	80 T.P.H.	23.5%
0" x 2"	192 T.P.H.	56.5%
Units No. 2—192 Tons Per Hour—0" x 2" Coal		
1 1/8" x 2"	51 T.P.H.	26.6% (15.0% of ROM)
3/8" x 1 1/8"	63 T.P.H.	32.8% (18.6% of ROM)
0" x 3/8"	78 T.P.H.	40.6% (22.9% of ROM)

ing screen plant. The 2 in. by 4 in., 4 in. by 6 in., and plus 6 in. sizes are rescreened at 2 in. round and delivered from Unit No. 1 to the loading booms.

In the vibrating screen plant (Units 2) the 0 in. by 2 in. coal, with the

rescreenings from the plus 2 in. sizes, are separated into three commercial sizes as follows: 1 1/8 in. by 2 in.—51 T.P.H., 3/8 in. by 1 1/8 in.—63 T.P.H., and 0 in. by 3/8 in.—78 T.P.H.

The separations are made on a battery of five double deck vibrating



Flow Diagram

## UNIT No. 1

## Screen Surfaces

	DETAIL OF SCREEN PLATES							
	First Section 2" Screenings, Out of R.O.M.				Second Section 4" Screenings from plus 2"		Third Section 6" Screenings from plus 4"	
Feed	End	End	End	End	End	End	End	End
Width	6'-0"	6'-0"	6'-0"	6'-0"	5'-0"	5'-0"	5'-0"	5'-0"
Length	1'-6"	8'-0"	4'-0"	4'-0"	8'-0"	4'-0"	4'-0"	4'-0"
Area (sq. ft.)	9	48	24	24	40	20	20	20
Perforations:								
Type	A	A	A	A	A	A	A	A
Dimension a	2 1/4"	2"	2 1/4"	2"	4"	4 1/4"	6"	6"
Dimension b	2 1/4"	2 5/16"	2 1/4"	2 5/16"	4 1/2"	5 1/16"	6 1/2"	6 1/2"
Dimension c	2 1/4"	2 9/16"	2 1/4"	2 9/16"	5"	5 1/2"	7 1/2"	7 1/2"
Dimension d (deg.)	30	30	30	30	30	30	30	30
Thickness of plate	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"
Kind of metal	TANK STEEL							

## UNIT No. 2

	DETAIL OF SCREEN PLATES									
	First Section 1 1/2" Separation 51 T.P.H. from 192 T.P.H. 0 x 2"				Second Section Partial 0 x 3/8" Separation		Third Section Completion of 0 x 3/8" Separation			
Feed	Scalper	End	End	End	Top	End & Top	Scalper	Scalper	Top	End & Top
Width	4'-0"	4'-0"	4'-0"	4'-0"	4'-0"	4'-0"	4'-0"	4'-0"	4'-0"	4'-0"
Length	8'-0"	8'-0"	8'-0"	8'-0"	8'-0"	8'-0"	8'-0"	8'-0"	8'-0"	8'-0"
Area (sq. ft.)	32	32	32	32	32	32	32	32	32	32
Perforations:										
Type	E	A	A	A	A	A	F	A	A	A
Dimension a	3/8"	1 1/8"	1 3/8"	1 1/4"	3/8"	3/8"	5/8"	5/8"	1 1/2"	1 1/2"
Dimension b	3/8"	1 1/8"	1 3/8"	1 1/4"	7/16"	7/16"	5/8"	11/16"	9/16"	9/16"
Dimension c	1 1/4"	1 1/2"	1 1/2"	1 1/2"	1 1/2"	1 1/2"	13/16"	11/16"	11/16"	11/16"
Dimension d (deg.)	1 1/2"	30	30	30	30	30	30	30	30	30
Dimension e	1 1/2"									
Dimension f	3/4"									
Thickness of plate	10 ga.	10 ga.	10 ga.	10 ga.	12 ga.	12 ga.	.105 dia.	12 ga.	12 ga.	12 ga.
Kind of metal	TANK STEEL				STAINLESS STEEL		STEEL	STAINLESS STEEL		

screens, with 4 ft. by 8 ft. gross screen surfaces on a 6 degree pitch. The screen motion is imparted mechanically giving a 3/4-in. simple harmonic stroke at a frequency of 453 per minute. The arrangement, screening surfaces and tonnages per hour are shown on the accompanying flow sheet.

The 0 in. by 2 in. coal is fed from a 40-ton surge bin by a reciprocating feeder to a series of three double deck vibrating screens. The 1 1/2-in. separation, 51 T.P.H. of 1 1/2 in. by 2 in., is completed on the top deck of the second and the bottom deck of the third unit. The top decks of the

first and third units act as scalp-ers for the 1 1/8-in. screens. The lower decks of the first and second vibrating units remove approximately half of the minus 3/8 in. from the feed. The 102 T.P.H. of product over these 3/8-in. units and through the 1 1/2 in., is delivered to two additional double deck screens operating in series. The top decks of these screens have 3/8-in. round perforations and are used as scalp-ers, and the lower decks have 1/2-in. round perforations which complete the separation of the nominal 0 in. by 3/8 in. product and the 63 T.P.H. of 3/8 in. by 1 1/4 in. coal.

Thus the 192 T.P.H. of 0 in. by

2 in. feed is separated at 1 1/8 in. round by two 4 ft. by 8 ft. surfaces with 1 1/8-in. perforations, aided by two 4 ft. by 8 ft. scalp-ers. The 3/8-in. product is made through two 4 ft. by 8 ft. surfaces with 3/8-in. round openings and two 4 ft. by 8 ft. surfaces with 1/2-in. round openings, aided by three scalp-ers.

No data are available as to just how much the surfaces used as scalp-ers assist those making the product separations, but it is evident that in any case they improve the thoroughness of the separation, particularly when the coal has more than average moisture.

The middlings from air tables cleaning the 1 1/2 in. by 2 in., 3/8 in. by 1 1/2 in., and 0 in. by 3/8 in. sizes are returned to the surge bin back of the screens, and the combined product is fed to the screens at approximately the same rate as the 0 in. by 2 in. coal comes to the surge bin from Unit No. 1, the difference being made up by less lost time in the operation of the vibrating screen plant than in the operation of Unit No. 1.

Submitted May, 1938.

Committee on Surface Preparation.

	Tonnages		
	1st Section	2nd Section	3rd Section
UNIT No. 1			
Maximum size over screen	23" x 12" x 11"	23" x 12" x 11"	23" x 12" x 11"
T.P.H. over screen	148	68	37
T.P.H. through screen	192	80	31
T.P.H. per sq. ft. through product	2	1.3	1.5
Inclination	level	level	level
UNITS No. 2			
	1st Section 1 1/2" Separation	2nd Section Partial 0 x 3/8" Separation	3rd Section Completing 0 x 3/8" Separation
Maximum size over screen	2"	1 1/8"	1 1/8"
T.P.H. over screen	51	102	63
T.P.H. through screen	141	39	39
T.P.H. sq. ft. through product	1.11	2.21	.3
Inclination (degree)	6	6	5



# WHEELS of Government

● *As Viewed by A. W. Dickinson of  
the American Mining Congress*

**E**ARLY in July only a handful of the members of Congress remained in Washington. Senators and Congressmen who face election campaigns at home made haste to get into the field, many of them grim in the knowledge that they will meet difficult opposition from new primary rivals with the strength of the administration blessing behind them.

The President wound up the task of signing bills and, with the toll of the congressional session thus completed, turned to other activities. While the Chief of the Democratic party urged votes in behalf of his congressional supporters in a tour through Ohio, Kentucky, Oklahoma, Texas, and the West, en route to Pacific fishing grounds, the Vice President cast his line at his home in Texas, and Foreign Relations Committee Chairman Key Pittman remained in Washington and did his fishing at Jefferson Island.

## Taxation

Aside from routine Treasury Department studies on taxation problems, always under way in the offices of the Joint Committee on Internal Revenue Taxation, no official move has been made as yet toward the writing of the Revenue Bill of 1939. The presidential address, made when the Revenue Act of 1938 became law, indicated his strong disapproval of the elimination of the undistributed corporate earnings tax and the decrease in rates of tax on capital gains. Press conferences and comments by administration advisers have indicated a tendency toward increased taxation, with a probability of going into the last reservoir, namely, the medium and low income brackets. As yet no Ways and Means Subcommittee has been appointed to prepare revenue recommendations, as has been the practice in previous years.

## Wage-Hour

The appointment of an Administrator for the "Fair Labor Standards Act of 1938" was delayed until July 15. The final choice was State Labor Commissioner of New York Elmer F. Andrews, 48 years of age and a civil engineer from Rensselaer Polytechnic Institute. He has worked on railroad construction in Cuba and factory building in New York, and was an Air Corps lieutenant in the World War. He became Deputy Industrial Commissioner of New York State in 1929, and succeeded Frances Perkins as State Labor Commissioner when she came to Washington as Secretary of Labor in 1933. Of considerable interest is the fact that Mr. Andrews was opposed to the inclusion of wage differentials in the Federal Wage-Hour Bill. While the Administrator stated at the time of his appointment that it would be 30 days before he could begin work in Washington, he has held conferences here with the staff of the Department of Labor and with numerous representatives of trades unions.

The Bureau of Labor Statistics and the legal staff of the Department of Labor have been working several weeks procuring information and preparing opinions which will be used in the administration of the Act. First industries to receive attention will be those in which the minimum wage is less than 25c per hour. Another problem is the development of a definition or a formula for determining what will constitute a "seasonal" industry. It is also reported that labor unions are much interested in the exact meaning of the law with reference to collective bargaining units to be certified as "bona fide" by the National Labor Relations Board, a matter closely concerned in the averaging of work hours over a 26-week or a 52-week period. This opens up the same difficulties

which have been encountered by industrial managements in the past years when more than one union becomes involved in an operation.

In connection with the problem of labor relations, a Federal Commission is now engaged abroad in the study of British and Swedish labor laws. On this Commission are Lloyd K. Garrison, first chairman of the National Labor Relations Board; Gerard Swope, Henry I. Harriman, Charles R. Hook, and William Davis (industrialists); Robert Watt, Massachusetts Federation of Labor; Anna M. Rosenberg, New York Region Director of the Social Security Act; and Marion Dickerman, social worker. The Commission is expected to report by fall. It is known that Senator Burke, of Nebraska, who has been an ardent advocate of repeal or amendment of the National Labor Relations Act, is engaged in a widespread study of the experience of industrial managements under the administration of the Act. Senator Burke will travel in England and the Scandinavian countries this summer to study their labor laws, with the avowed purpose of cooperating with other Senators and Congressmen toward amending the Act in the coming session of the Congress.

## Stream Pollution

In his consideration of the bills sent to the White House at the end of the congressional session, the President sprung a surprise on those interested in the Vinson-Barkley Stream Pollution Bill by vetoing it, with this accompanying message:

"I have withheld my approval of H. R. 2711, 'An Act to Create a Division of Water Pollution Control in the United States Public Health Service, and for other purposes.'



"This bill authorizes the appropriation of \$300,000 for administrative expenses of the Division of Water Pollution Control, \$700,000 for expenditure by State health authorities for the preparation of project requests, and in addition, such amounts as may be necessary for loans and grants-in-aid of States, municipalities, public bodies, or individuals to carry out projects for treatment works to prevent water pollution.

"I appreciate the importance of the results sought to be accomplished by the legislation and I fully approve the establishment of a Division of Water Pollution Control in the Public Health Service. This bill, however, provides for the direct presentation, through the Secretary of the Treasury, of the recommendations of the Surgeon General for the authorization by Congress of specific projects to be carried on under the loan or grant-in-aid provisions of the bill, without any opportunity for review by the Chief Executive.

"Thus, this bill provides for the legislative assumption of responsibilities of the executive branch, and, therefore, runs counter to the fundamental concept of our budget system that the planning of work programs of the executive agencies and their presentation to Congress in the form of estimates of appropriation is a duty imposed upon the Chief Executive and not one for exercise by the legislative branch.

"I am convinced that appropriations for projects of this character should be based upon estimates submitted in the annual Budget. Only in this way can the merit of such projects be considered in their proper relation to the merits of other projects of a similar nature, and all of these projects be then considered in their relation to the needs of the other Government activities that are presented for incorporation in the annual Budgets."

There is little doubt that drastic stream pollution legislation will again be introduced in the first session of the 76th Congress which convenes in January, 1939, and that the whole issue will have to be threshed out again as has repeatedly been the case in past years.

AUGUST, 1938

## Monopoly

The Temporary National Economic Committee authorized by congressional resolution has held a number of meetings; in addition to Senators O'Mahoney, King, and Borah, and Congressmen Sumners, Eicher, and Reece, the Committee now includes Chairman W. O. Douglas of the Securities and Exchange Commission, Chairman Garland Ferguson of the Federal Trade Commission, Herman Oliphant of the Treasury, Thurman Arnold of the Department of Justice, Isadore Lubin of the Department of Labor, and R. C. Patterson of the Department of Commerce. Chairman Douglas of the SEC is being represented by Commissioner Jerome Frank, and Chairman of the FTC by Commissioner Ewin L. Davis.

The full Committee has appointed an Executive Committee on procedural matters consisting of Senator O'Mahoney, chairman; Representative Sumners, Assistant Attorney General

Thurman W. Arnold, Assistant Secretary of Commerce R. C. Patterson, and Labor Statistician Isadore Lubin. Subjects of study have been allocated to the administrative members of the Committee as follows:

Department of Justice—Combinations, mergers, and price policies.

Treasury Department—Government construction (bids on supplies received by the Procurement Division) and anti-trust laws here and abroad.

Department of Commerce—Information from NRA, Census Bureau, and Bureau of Foreign and Domestic Commerce. Size of industrial groups.

Department of Labor—Price policies and their effect on labor and employment.

Securities and Exchange Commission—Corporation powers and structures.

Federal Trade Commission—Production and distribution.

The six congressional members of

(Concluded on page 49)

Main Entrance to Archives Building, Washington, D. C.





Beautiful vistas  
such as this  
will greet you  
in and near  
Los Angeles

## PROBLEMS of METAL MINING to Receive Attention of Industry's Leaders

**I**MPELLED by the enthusiastic driving power of the Los Angeles mining crowd, activities of all responsible committee members are now going full steam ahead perfecting plans for the Fifth Annual Metal Mining Convention and Exposition of the Western Division, American Mining Congress, to be held at the Ambassador Hotel in Los Angeles, October 24-27.

Following the successful meeting of the National Program Committee in Los Angeles June 21, much progress has been made under the guidance of Chairman T. H. O'Brien, vice president and general manager, Inspiration Consolidated Copper Company, in lining up a series of papers that will truly be an **INSPIRATION** for the many hundreds of responsible metal mining executives and operators who will attend.

Although it is as yet too early to

announce specific titles of papers and speakers during the four-day session, tentative plans call for discussion of such subjects as: the right to mine; Western mining and the Federal Government; mine financing as viewed by the investor; improving procedure in mine security registration, including a report of the American Mining Congress Committee for Cooperation with the S.E.C. and discussion of legal and engineering problems; important mine operating problems, including concentration of silver ore, improvements in crushing and grinding, mining problems in the Philippines, gold dredging, potash production, economics of phosphate development, and slusher loading in driving inclines; pressing legal, tariff and public relations problems of mining; health conservation and safety practices and methods, including a discussion of

ventilation in deep metal mines; a symposium on prospects for iron ore, copper, lead, zinc, gold, silver, and minor metals and industrial minerals; gold, silver and international exchange; fiscal policies of our Government and current taxation problems facing the mining industry; industrial relations today; Federal wage-hour law; and relation of Government to industry.

All these subjects are of genuine interest and concern to the metal mining industry; in order to keep the program well within the allotted time and to permit adequate floor discussion, it may be necessary to omit some of the above titles from the final program. Delegates are assured, however, a variety of papers of intense interest by men of outstanding attainment in mining, industrial and governmental fields.

Under the chairmanship of Robert Linton, consulting engineer of Los Angeles, the general committee on arrangements is working industrially on plans to assure all those attending a worth while and enjoyable visit. Heading the committees are: Harvey S. Mudd, widely known mining man of Los Angeles—*Welcome to Delegates*; P. G. Spilsbury, Anaconda Copper Mining Co.—*Entertainment*; Y. D. Hills, Timken Roller Bearing Co.—*Exhibits*; Garnett A. Joslin, mining engineer of Los Angeles—*Hotels*; M. J. Holmes, Braun Corp.—*Annual Dinner*; Major Julian Boyd, Pacific Coast Borax Co.—*Reception*; E. O. Slater, Smith-Emery Co.—*Excursions*; and W. C. Browning, Golden Queen Mining Co.—*Finance*.

Entertainment plans, now being formulated, include a welcoming luncheon on Monday noon, and an informal get-together party that night, with dinner, dancing and special entertainment at the Palomar. Tuesday night delegates will gather in Olvera Street in the environment of Early California Days, where the fine history and tradition of southern California will be revealed in quaint and unforgettable manner. Wednesday night will be left open, permitting guests to choose their own particular form of amusement from the great variety of headline features to be found in the vicinity. Culminating the convention activities will be the Annual Dinner to be held Thursday night at the world-famous Cocoanut Grove of the Ambassador Hotel.

Field excursions to many of the in-



Golden Queen mine and mill in the Mojave district—to be visited on one of the field excursions

tensely interesting mineral enterprises in southern California are being planned for Friday and Saturday, prominent among which will be an inspection of the world-famous Golden Queen mine and mill in the Mojave district.

Arrangements are steadily advancing for the all-important exposition to be held in the beautiful Fiesta Room of the Ambassador. Los Angeles is an important supply center for the great mining enterprises of the Southwest, and convention delegates are assured a display of up-to-the-minute metal mining equipment and supplies by prominent national and local manufacturers that will merit their careful

inspection. Representatives will be there to offer expert advice on methods of meeting perplexing operating problems and securing lower cost production.

Over and above the valuable features of the convention and exposition proper, visitors will have the opportunity to see the many world-famous spots in the Southwest, including Hollywood, Catalina Island, a swim in the long rollers of the Pacific, Boulder Dam, Grand Canyon, and the well-known Arizona copper mines—to name only a few. Plan NOW to see all your friends at Los Angeles—October 24-27—and be educated and entertained royally!

The Ambassador Hotel at Los Angeles—where the Convention and Exposition will be held







# NEWS and VIEWS

## Kennecott Plans to Reopen Mines

Probable reopening of the huge mines and mills of the Utah Copper Company on or about August 1 was indicated by a notice posted at the company's office at Bingham on June 30. The world-famous copper mines closed down on June 16 because of a stagnant copper market and rapidly increasing stocks of the unsold metal. Recent increases in sales, strengthening the price structure and providing a healthier tone to the stock situation, together with the general improvement in business outlook have apparently brought about this move, although changed conditions in the interim may cause a revision of plans.

Signed by D. D. Moffat, vice president and general manager of the company, the notice read as follows:

"In conformance with the last paragraph of notice of suspension of operations posted June 1, 1938, you are hereby informed that according to present expectations the Utah Copper Company will resume productive operations on or about August 1, 1938, at approximately the same rate of output that was in effect prior to June 16."

Reopening of the Utah Copper Company's mines and mills at the 50 percent capacity rate which was maintained at the time of the close-down, would assure continued operation of the American Smelting and Refining Company's Garfield smelter, which has been operating on stored ores during the close-down. According to W. J. O'Connor, general manager of the operation, the stored supplies would have been exhausted by the middle of August.

The Nevada Consolidated Copper Corporation, subsidiary of Kennecott, has posted notices at Ruth and McGill advising employes that stripping operations at Copper Flat would be resumed on July 16; that on August 1 mining of ore on a limited scale will be undertaken in the Ruth Mine; that smelter operations at the McGill will

be resumed on a part-time basis; but that mining of ore from the pit at Copper Flat is not planned for the immediate future.

## Construction on Kopperston Homes

Construction is proceeding on the first 100 residences at Kopperston, W. Va., the garden-home village which The Koppers Coal Company is building for its miners near the site of its new mine in Wyoming county.

The houses are being built by R. H. Hamill Company, Huntington, W. Va., and are to be ready for occupancy late this summer. The amount of the contract was not revealed but it is believed to total nearly \$250,000. Further building will depend upon future business conditions, it is stated.

It is estimated that the project will provide employment for as many as 150 workmen during the most intensive stages of construction and will require about three months to complete.

Concerning the enterprise, J. P. Williams, Jr., president of The Koppers Coal Company, said:

"The present state of the coal industry hardly warrants such an expenditure as we are now making but we are starting this new community and mine because we have faith in the future of the industry and in the future of our nation. By building at this time, we are providing added employment in West Virginia and helping to demonstrate the idea that progressive action now is the stimulus which will lift all business and industry out of the present situation."

## Coeur d'Alene Shaft Completed

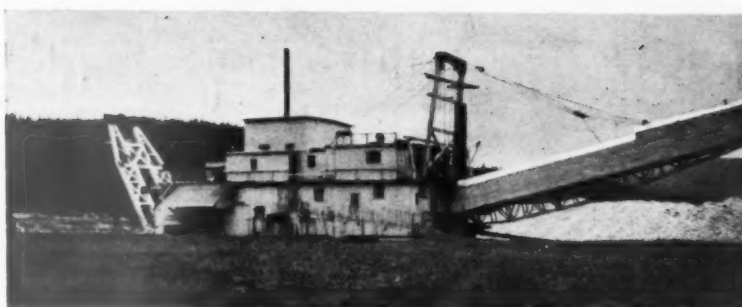
Coeur d'Alene Mines Corporation has completed a new 1,000-ft. shaft from its tunnel level, and is now cross-cutting for 500 feet to strike the siderite vein that was exposed by diamond drilling. The property is in the silver belt of the Coeur d'Alenes west of Wallace, Idaho. Joseph V. Grimmer, contractor, did rapid work in sinking the shaft, completing it ahead of the specified July 4 date. The shaft will give considerably more than 2,000 ft. depth on the vein from the surface.



One of the 5-room Kopperston dwellings. Of the 100 first houses, 60 will have 4 rooms and 40 will have 5 rooms. There will be six different exterior designs of the 5-room type

## New Operation of Christopher Mining

The Christopher Mining Company of Morgantown, W. Va., recently opened its Robinson Run No. 2 mine, a new operation having a daily rated capacity of 8,200 tons and employing 500 men. The new mine represents an investment of approximately \$500,000 in modern coal mining and handling equipment, and is the culmination of extensive development work by Frank E. Christopher, president of Christopher Mining Company, and L. H. Kelly, president of Pittsburgh and Fairmont Coal Company. The Christopher Mining Company has a marketing agreement by which its production is sold through the Pittsburgh and Fairmont Coal Company.



Plant of Warren Dredging Co., formerly Idaho Gold Dredging Co., operating in Warren Meadows, near Warren, Idaho. Nearby is a similar operation by Braumhoff-Fisher Co. E. T. Fisher is president and manager of both enterprises, employing a total of about 50 men

tion of its employees who have willingly held up their end in spite of the wage reductions made necessary by low metal prices in the recent past.

tunnel, which is on a level 75 ft. above the raise. This is a Spokane enterprise, with Charles H. Goodsell, of that city, mining engineer, in charge.

## Labor Board Upholds Sunshine Strikers

The Sunshine Mining Company in the Coeur d'Alene district, Idaho, was ordered July 1 by the National Labor Relations Board to rehire 216 employees who participated in a strike at the company's plant last August. The Board's decision upholds the findings of the trial examiner, P. H. McNally, and orders the company to pay the strikers back pay less earnings made at any other employment from August 18, 1937.

R. M. Hardy, president of the Sunshine Company, announced the same day that the company would appeal the order.

## Combined Metals Grants Paid Vacations to Employees

Employees of the Pioche, Nev., mines of the Combined Metals Reduction Company will enjoy vacations with full pay, according to a new plan recently announced by the company.

Effective early in July, the company will allow all employees on days pay and company contractors who have one year's service or more a vacation of one week with pay at the prevailing wage at the time the vacation is taken. Employees and contractors who have been continuously in the employ of the company for five years or more will be allowed a vacation of two weeks with pay at the prevailing wage at the time the vacation is taken.

At the same time the company expressed its appreciation of the coopera-

## Old Timers Hold Annual Reunion

The Fourteenth Annual Reunion of members of the Union Pacific Coal Company Old Timers' Association was held at Rock Springs, Wyo., June 18.

Harry A. Wylam, president of the association, presided at the morning business meeting at which the eulogy for the departed members was given by Reverend Bruce K. Blunt, and pertinent comments were added by Eugene McAuliffe, president of the Union Pacific Coal Company. Newly elected president of the association is O. C. Buehler, of Hanna, Wyo.

A colorful parade was enjoyed in the afternoon, following which the banquet was held in the evening. George B. Pryde, Vice President, Operation, was toastmaster, and the principal address was given by Mr. J. L. Haugh, Vice President, Union Pacific Railroad, who substituted for President W. M. Jeffers who was unable at the last minute to attend.

## Glacier Strikes Ore

Glacier Silver-Lead Mining Company has struck its long-sought ore at its property south of Libby, Mont. After two years of exploration, including diamond-drill work, the ore was encountered in a raise up 50 ft. from the long No. 4 tunnel where it has 800 ft. of backs. The size of the ore body has not been determined, but the raise is entirely within the ore. The company will now reach this ore body by an extension of its No. 3

## Georgia's Gold Development

The work of reopening the Royal-Syndicator gold mine, located near Tallapoosa, Ga., is progressing nicely under the direction of an engineer of the Boston, Mass., party who optioned the mine for the purpose of fully investigating with the right to purchase if it proved satisfactory. The open pit has been dewatered and the work on reopening the shaft is going forward, a new headframe has been erected, and the shaft has been retimbered from the surface down to the solid rock formation. The shaft connects with an extensive drift system on two levels from which large quantities of ore were mined about 40 years ago when the mine was operated on a large scale with the best milling equipment in Georgia.

A conspicuous feature is the absence of any waste dump on the property. Dr. Marshall Haney, a mining engineer of Geer, Va., handled the negotiations on this deal, and he states that the demand for gold mines situated in the Appalachian gold belt is increasing.

## Coal Map of Indiana

Compiled jointly by the Department of Geology of the Indiana State Teachers College and the Coal Trade Association of Indiana, a new coal map of the State of Indiana presents considerable information of real interest and value to coal operators. Shown on the map are: Location of the rail shipping mines, each identified

by numbers; name of each producer; name of mine; railroad location; vein of coal; and the county in which the mine is situated. In addition an alphabetical list of the mines by name is given. Also included is a diagrammatic section of the coal measures.

Copies of the map can be secured by addressing Jonas Waffle, managing director, Coal Trade Association of Indiana, 400 Opera House Block, Terre Haute. Price is \$1.75 with wooden rod at top and bottom, and \$1.50 without the rod.

## Pocahontas Exhibition Mine Opened

The only mine in the world equipped to show sight-seers how coal is produced has been built by the Pocahontas Operators Association near Pocahontas, Va., and thrown open to the public for inspection without charge until further notice. The exhibition mine was dedicated by the

National Editorial Association, over 400 members of which attended the ceremonies recently. The most remarkable thing about the unique mine is that a paved road has been built through it, enabling an automobile to traverse its entire length through the coal seam, which is over 11½ ft. high at this place.

Everything that occurs in connection with mining coal can be viewed by visitors without leaving the seats of their cars. "Rooms" have been cut in the coal seam to show cutting a "kerf" in the coal, preparatory to drilling holes in the coal seam and shooting the coal down with explosives. Two "rooms" show these operations, and the third "room" shows the method of loading the five-ton steel cars by hand. How posts, or timbers, are set to support the roof of the mine is shown at various places just as in actual mining practice. Stoppings, brattices or other methods of sealing and directing ventilation are also actually illustrated, graphically proving that mining men have been air-conditioning their working places for many

years. Part of the mine is rock dusted to show how the danger of mine explosions is minimized and actual explosions sometimes stopped. Mine drainage is also illustrated by necessarily actual conditions.

In the mine a display case shows the finished product of the various sizes produced in the Pocahontas coal field. Outside, right around the corner, is one of the biggest and most complete tipples, where the job of preparing coal for market may be viewed in actual practice. Just a few yards farther practically all of the other operations of mining in the Pocahontas coal field are going on in the real commercial way, so that a real education is available for coal merchants and all other users of coal.

Visitors are invited to park their cars and go through the mine on foot the second time and get the benefit of a lecture, or a personally conducted tour of the mine, by men of long experience who are in attendance daily from 10 a. m. to 5 p. m., including Sundays. Special arrangements may be made for handling parties or conventions. The exhibition mine fills a long felt need of the Pocahontas operators, as it solves the problem of showing mining without any of the dangers of taking visitors into mines during regular operating time.

The mine has a real historical value, as the approximately one-fifth of a mile of entry is part of the main haulage way and air passage of the first, or original, Pocahontas mine of the Pocahontas Fuel Company Incorporated, opened in 1882, from which the first Pocahontas coal was shipped in 1883. The exhibition mine is a scenic attraction for the southern part of the Virginias, rivaling the caverns and other wonders of nature, because it has the educational aspect and the human interest curiosity many people have about the source of their fuel, which has given them power and comfort all of their lives.



Left—  
Entering  
Pocahontas  
exhibition  
mine  
Below—  
View inside  
the mine.  
After driving  
through, visitors  
make the trip  
on foot and  
are told the  
story of coal



## Rich Ore Strike in Old California Mine

Discovery of a vein 18 to 30 inches wide which assays 190 ounces of silver and 71 percent lead below old workings in the Rip Van Winkle mine in the Lone Mountain district of California has recently been reported. The ledge was cut by a drift from the 117-ft. level of the shaft, and is thought to be an extension of the ore body



which yielded large amounts of high grade ore more than 60 years ago.

Shipments to a Utah smelter have begun, and the management expects to increase the output within a short time to 50 tons per day. The company is continuing its drifting operations, in the hope of reaching ground supposed to contain another rich shoot.

### Hanna Acquires West Virginia Holdings

Option on the entire holdings of the "Little Kanawha Syndicate" in Marion County, W. Va., was recently acquired by the Hanna Coal Company, Cleveland, Ohio, according to an announcement. The property is adjacent to the Grant Town acreage of the Koppers Coal Company, and it was expected that drilling of the approximately 10,000-acre tract would soon be made to determine the extent of the coal seam.

S. Dunlap Brady, Jr., of Morgantown, whose father was one of the syndicates founders, has represented the group during the past few years.

### Earling Mine Reopens

The Earling mine of the West Virginia Coal and Coke Corporation near Logan, W. Va., has resumed operations after a shutdown of 7 months, according to a recent announcement by A. F. Whitt, general superintendent. Full-time operation, in which a force of 200 men is employed, was reached in July. Edward Jones is superintendent of the Earling mine.

At the time the mine was closed last November, many of the men thrown out of work were given employment in five other mines of the West Virginia Coal and Coke Corporation in Logan County.

### Reed Resigns From Consolidation

In an official statement released July 22 by the Consolidation Coal Company, with offices in New York City and operating headquarters at Fairmont, W. Va., it was revealed that David E. Reed has resigned as general manager of operations, and that Charles Dorrance, vice president in charge of operations, would become

vice president and general manager of operations.

Reed has been in ill health for some time, and left immediately for Cincinnati, Ohio, to undergo medical treatment. During his tenure with the company, Reed had served in every capacity from mine foreman to general manager of operations.

F. F. Jorgensen, manager of production, was named assistant to the general manager; Fred E. Bedale, safety engineer, was made assistant to the vice president in charge of safety and operating efficiency, and A. E. Thurnes, assistant to the general manager, was named assistant to the vice president.

### Motor and Generator Standards

A new standard has been released by the National Electrical Manufacturers Association. This publication, "NEMA Motor and Generator Standards, Publication No. 38-49" supersedes the previous edition of the "NEMA Motor and Generator Standards, Publication No. 34-22" which was published in 1934.

The new volume contains all the information in the previous edition somewhat modified and augmented. Some of the new material comprises temperature ratings of various types of enclosed motors, standardized lettering for flange mounted motors, method of measuring motor vibration, etc. The section dealing with adjustable-speed direct-current motors has been revised to give the horsepower ratings for continuous, one hour and tapered duty. A new standard which should prove of interest is a table of

maximum speeds by field weakening for constant speed DC motors having standard horsepower and speed ratings.

Copies of this publication may be obtained from the National Electrical Manufacturers Association, 155 East Forty-fourth Street, New York, N. Y., for \$2 a copy.

### Fire Halts Production Temporarily at Page Mine

The Page mine of the Federal Mining and Smelting Company near Kellogg, Idaho, was the scene of an underground fire on June 19 and 20 which resulted in some damage on the 1,500 level and stopped production during the week.

Quick work by helmet crews under the direction of James Wilson, superintendent of the U. S. Bureau of Mines Rescue Car at Kellogg, brought the blaze under control after several hours of work. Approximately 150 feet of tunnel was affected by the fire which burned along the timbers.

Operations at the property, which employs about 175 men, were resumed June 23.

### U. S. Smelting to Produce High Grade Zinc

The U. S. Smelting Refining and Mining Company, for many years one of the leading producers of silver and lead, recently announced its entry into the field of high grade zinc. Heretofore the zinc concentrates, mined at the company's Bingham properties near Salt Lake City, were sold to the Anaconda Copper Mining Company.



Main thoroughfare and "civic center" of Warren, central Idaho. The town is still the center of some gold mining, although it is not the camp that it was in 1861, when thousands of hardy miners clicked their glasses in the barrooms, initiated a movement for the establishment of the "Territory of Idaho," and sent to Congress the first petition asking that "Idaho" be set apart from Washington Territory.

Under a new arrangement, these will be refined by Anaconda for account of United States Smelting, Refining and Mining Company, which will sell the resultant zinc directly to the trade.

The company will offer the following grades of electrolytic zinc: special high grade, analyzing 99.99 percent plus in zinc purity; intermediate; brass special; and prime western. This zinc, as well as the other metals produced by the company, will be sold through its New York office at 57 William Street.

### Industrial Collieries First Aid Meets

Another successful season of first-aid contests was completed by the Industrial Collieries Corporation with six meets held recently. Four of this year's contests were held in Pennsylvania, at Marianna, Slickville, Heilwood and Johnstown. The other two were held in Berryville, and Sabraton, W. Va. During the training period more than 1,000 company employees and approximately 300 boys and girls, mostly children of the employees, received first-aid instruction. A total of 144 teams took part in the various contests; 112 white men's teams, 5 colored men's teams, 13 boys' teams and 14 girls' teams.

Cash prizes were awarded at each contest to the three men's teams having the highest scores; the two highest boys' and girls' teams in each case were given special prizes. The meets were all well attended and the judging was capably done by representatives of the U. S. Bureau of Mines, Pennsylvania Department of Mines, West Virginia Department of Mines, and representatives of the various coal companies from Pennsylvania and West Virginia.

### New 5,000-Foot Shaft Planned for Homestake

Construction of a new operating shaft of the Homestake Mining Company at Lead, S. Dak., has been authorized, according to a recent announcement by Guy N. Bjorge, general manager. Preliminary work has already been started, and it is estimated that some 2½ years of construction work will be necessary to complete the project.

The new shaft will eventually replace the Ellison Shaft, which will be wrecked by ground movement when

pillars now supporting it are mined, according to Mr. Bjorge. It will be located on the ridge above the South Mill, and will be equipped for the same depth capacity as the Ross shaft, 5,000 feet. Cost of the shaft and surface plant will be \$2,500,000, and it will be named the Yates in memory of B. C. Yates, who was general manager of the Homestake Mining Company for 20 years.

"All work of shaft sinking and construction of the surface plant will be done by the Homestake organization," according to Bjorge's statement. "There are now more men in the Lead community than will be needed for the additional work. Outside workmen are advised not to come to Lead to seek employment."

### Consolidation Team wins Safety Meet

In a contest marked by keen competition and close decisions, a first aid team representing the Owings No. 32 mine of Consolidation Coal Company was adjudged the winner of the seventh annual safety day contest of the Central West Virginia Coal Mining Institute, held July 23 at Jackson's Mill, W. Va. The team from the Federal No. 1 mine of the Koppers Coal Company at Grant Town, state champions at the present time, finished second by a single point.

Victory of the Owings team will result in Consolidation having three teams in the state safety day meet to be held in Fairmont October 8. Jordan No. 93 and Rivesville No. 97 finished in first and second places, respectively, in the Monongahela Valley Coal Mining Institute's safety meet at Sunset Beach near Morgantown held July 16.

Governor Homer A. Holt, of West Virginia, was the principal speaker at the Jackson's Mill meet. He stressed the value of following safety methods in every walk of life and in the home, stating that mines of the state are showing the way to other industries from the safety standpoint. He praised the work of the U. S. Bureau of Mines, and expressed his official appreciation of the cooperation the State Mine's Department has received from the Federal Bureau.

The winning team will be taken on an aeroplane tour to Washington, D. C., by Representative Andrew L. Edmiston, of Weston, who has worked hard recently to obtain a branch of the U. S. Bureau of Mines in West

Virginia. Sound motion pictures of the meet were taken by the U. S. Bureau of Mines.

Director Charles E. Lawall, of the West Virginia University School of Mines, acted as master of ceremonies for part of the activities, during which he introduced the governor.

### Rocky Mountain Institute Meeting

The thirty-sixth regular meeting of the Rocky Mountain Coal Mining Institute, held in Denver, Colo., June 23, 24 and 25 at the Shirley-Savoy Hotel, proved to be the largest meeting ever held by the Institute. Men from the far east and the far west met in Denver to renew old friendships and make new ones, and to attend the interesting program and visit the fine exhibits that were on hand.

Papers presented at the meeting were as follows: "Rock Dusting," by Gilbert C. Davis; "Use of Shaker Conveyors in Southern Colorado," by George B. Dick; "Brilliant Mine (a movie)," by Glen Sorensen; "Mine Haulage Problems," by B. F. Shubart; "Education of the Miner," by Thomas Allen; "Oliver Coal Company Mine (another movie)," by Ronald Oliver; "The Necessity for Controlled Slack Preparation," by Fritz Nyman; "Automatic Mine Car Coupler (another movie)," by Ohio Brass Company; "Modern Methods of Coal Cutting," by John H. Emrick; "Safety Greeting to the Institute," by Dan Harrington; "Recent Trend in Coal Preparation," by J. B. Morrow; "Mine Safety," by Matt Strannigan; "Mine Timbering," by Hugh McLeod; "Mine Drainage," by P. F. Robbins; "Steel—Man's Servant (a movie in technicolor)," by United States Steel Corporation; and "Need of Standardization," by G. B. Southward.

Officers for the coming year elected at the meeting are as follows: H. C. Marchant, Colorado-Utah Coal Co., president; F. W. Whiteside, Consulting Engineer, Denver, secretary-treasurer; George B. Dick, Gordon Coal Company, vice president for Colorado; P. H. Holland, Phelps Dodge Corp., vice president for New Mexico; H. C. Livingston, Union Pacific Coal Company, vice president for Wyoming; and F. W. Koehling, Liberty Fuel Company, vice president for Utah.

Directors chosen comprise C. E. McWhorter, and C. R. Garrett, for Colorado; Horace G. Moses, L. C. White, for New Mexico; C. M. Shott

and Glen E. Sorensen, for Wyoming; and Wilford Ruff and Walter F. Clarke, for Utah.

Chairmen of the various committees working under the direction of A. F. Krippner, general chairman, comprised Mr. Denny, program committee; Mr. Veatch, entertainment; Mr. Emrick, banquet; Mr. Franklin, exhibits; and Mr. Robinson, souvenirs. Mrs. Fred Whiteside directed the work of planning entertainment for the ladies.

### Emma Mine Reopened

Operations at the Emma mine of the Butte Copper and Zinc Company have been resumed by the Anaconda Copper Mining Company, lessee of the property. A crew of 125 men is again at work on the operation after a shutdown of a number of months, in order to satisfy requirements of the Colorado Fuel and Iron Corporation for manganese in producing steel for the U. S. Navy.

### Determining Causes of Anthracite Mine Fires

Information that should have practical value in the determination of the causes of anthracite-mine fires has been developed by the Bureau of Mines, Department of the Interior, as the result of a study of the effect of oxidation on the volatile matter of anthracite. The data may also prove useful in determining whether anthracite has undergone excessive weathering at normal temperatures over extended periods of time.

The Bureau of Mines is conducting investigations to determine the causes, behavior, and control of anthracite-mine fires; and as a part of this program, the detection of incipient heating underground in the mines and above ground in refuse banks has received consideration, it is stated by G. S. Scott, G. W. Jones and H. M. Cooper, in a report just published.

It has been shown that when normal dry air is passed through anthracite at high temperatures the amounts of evolved gases and their relative proportions varied with the temperature. Further work has been done on the changes that occur in the composition of the coal due to oxidation at temperatures up to 400 degrees C. This report gives the results obtained on nine anthracites, two bituminous, and two sub-bituminous coals.

It was found that different types

of anthracite had different rates of increase of the volatile-matter content at elevated temperatures, the general trend, however, being the same. Increase of the volatile-matter content with increased temperature of oxidation was found to hold only for anthracites. The bituminous and sub-bituminous coals tested showed erratic results, and no definite relationship to the temperature of oxidation was observed.

Results given in this report may have practical value in the determination of causes of anthracite mine and bank fires, especially with respect to determining whether the causes are due to spontaneous heating of the coal. By taking samples of anthracite from an area where normal temperatures are known to have prevailed, and comparing the volatile matter content of these samples with similar samples suspected of being oxidized at higher temperatures, the percentage increase of the volatile matter of the suspected samples should indicate the probable oxidation temperature to which the coal may have been heated.

Copies of this paper, Report of Investigations 3398, "The Effect of Oxidation on the Volatile Matter of Anthracite and Its Significance in Mine Fire Investigations," may be obtained from the Bureau of Mines, Washington, D. C.

### Mining Program of California Operators

Mining operators of California recently formulated nine suggestions in a constructive mining program for the advancement of the industry. These principles comprise the following:

- (1) Establishment of an independent department of mines;
- (2) investigation, correlation and redefinition of mining compensation insurance in relation to social security, unemployment insurance and pneumoconiosis legislation;
- (3) intensification of safety educational activities for protection of miners;
- (4) no withdrawals of metalliferous lands by congressional enactment or presidential authority;
- (5) mine to market roads;
- (6) full support for debris restraining dams construction;
- (7) protection of California minerals in all reciprocal trade agreements;
- (8) opposition to all legislation which would tend unfairly to restrict dredging, lode, hydraulic, drift and other mining operations; and
- (9) full cooperation with agricultural interests and sportsmen to the end that

streams may be used beneficially by miner, farmer and sportsman alike.

Subject to future discussion and consideration before final action, the foregoing points have been approved in principle by the Mining Association of the Southwest in Los Angeles, the Bureau of Mines of San Diego County and the Mining Association of California.

### Wheels of Government

(Continued from page 41)

the Committee have been paired with administrative members in order to acquire more intimate knowledge of the work, and thus be well prepared to discuss details on the Senate and House floors at a later date. Chairman O'Mahoney is assigned to the Securities and Exchange Commission, Senators King and Borah to the Department of Justice and the Federal Trade Commission, Representative Sumners to the Treasury, Representative Reece to the Department of Commerce, and Representative Eicher to the Department of Labor.

It is understood that hearings will not be held until fall, probably late in September, and Senator O'Mahoney has given repeated assurances that it is the intent of the Committee to make a wide, thorough, and factual study which may cover many months.

### Bituminous Coal

In sharp contrast to Federal policies with reference to alleged monopolies and price fixing is the attitude evidenced in Federal treatment of labor, agriculture, and finally the problems of the bituminous coal industry. In explaining these varying viewpoints administration advisers say that bituminous coal is a "sick" industry.

The National Bituminous Coal Commission has concluded hearings in Denver and in Washington on western and eastern districts, in the course of which the weighted average costs of the various districts have been presented by representatives of the District Boards. It is understood that the Commission will base its weighted average cost findings on the first three months of 1938 and the last three months of 1937. It is now expected that new prices will be announced about the first of December. It is reported that the entire set-up of the Commission is in a much healthier and more efficient status, and that the commissioners are now looking forward to a successful administration of the Act. (Further details on page 50.)



## Russian Mineral Industry

An authoritative and comprehensive review of mineral production and trade of the U. S. S. R. is given in section 2 of the *Foreign Minerals Quarterly* for June, 1938, prepared and released by the Foreign Minerals Division of the Economics and Statistics Branch, U. S. Bureau of Mines.

Comprising 72 pages, the bulletin presents best available information, up-to-date, on seven mineral commodities used in the iron and steel industry, 12 of the non-ferrous metals, and 14 of the nonmetals, including fuel. It is aptly pointed out that the mineral industries are being operated not necessarily on a commercial basis where costs are considered, but on one of national convenience. "The Soviet authorities are attempting to solve the problem of poverty in the midst of plenty and from it create ultimately a more secure life for the masses. In the meantime, however, its object is to build up a powerful self-sufficient state," the authors state.

## Aurum Offer Rejected by Eureka

An offer by Aurum Mining Company of Wallace, Idaho, to take over all the holdings of the Eureka Mining and Milling Company of Republic, Wash., in return for which Eureka stockholders would be given stock in the Aurum Company for their interest, was recently turned down by the Eureka Company. It was reported that George A. Kirkbride, president of the Eureka Company, favored the merger.

Following its decision, the Eureka Company announced plans to increase milling capacity at its property to 150 tons per day, which represents a doubling of its operations in the past. Property owned by the Eureka comprises the Old Republic and Quilp Mines. H. E. Leffler is superintendent.

H. L. Day, Jerome J. Day and Henry L. Day, of Wallace, Idaho, control the Aurum Company, which is said to have extensive plans for operating in the Republic Gold camp. Their interests heretofore have been chiefly in such large Coeur d'Alene companies as Hercules, Tamarack and Custer, Dayrock and Sherman-Lead. Without acquiring the Eureka, the Aurum Company has vast holdings in the Republic district, including the Tom Thumb, Surprise, Ben Hur and Black Tail properties. No announce-

ments have been made of the company's plans, but it has become very active in a quiet way, and it is said that it plans to sink a new 700-ft. shaft to open its properties, and to build a large mill.

## Strike Ore at the Polaris

Discovery of a sizable deposit of commercial ore on the 1900 level at the Polaris mine in the silver belt of the Coeur d'Alene district, Idaho, was recently reported. Although assays have not been announced, it is understood the values will run very high in silver content. The vein was reached from the 1,900 level by a crosscut about 1,000 feet in length.

Later reports indicated that drifting on the vein on the 1,900-ft. level is meeting with excellent results. The drift is in ore, high in silver content and of a more extensive nature than in other parts of the mine. Length of the ore body on this deep level will be determined by drifting, but indications point to a long shoot of commercial ore from which a large tonnage will be available for mill treatment.

Official confirmation of the strike was made by President J. F. McCarthy, who said that the ore disclosure was an important one but that further work would be necessary to determine the full extent and richness of the new discovery.

## Coal Commission Completes Hearings

Representatives from every production district in the United States have appeared for the bituminous coal industry at hearings conducted by the National Bituminous Coal Commission at Denver and Washington, and have placed in the record a mass of evidence from which the Commission must determine the weighted average costs of production by districts. After 10 full days of hearings the Commission is now analyzing the cost data preparatory to announcing final cost figures upon which district boards will be asked to base proposed minimum prices.

Representatives from each of the coal producers boards in minimum price areas No. 1 through No. 5, as well as individual operators from each of the eastern and midwestern coal producing states, were present at the hearings.

Opening on July 6, the Commission heard the representatives of District Board No. 1 propose a cost determination of \$2.3940 per ton. The Commission's statistical bureau computed the cost at \$2.37 per ton. Reconciliation of the difference will be made from the record of the hearing. Walter A. Jones, secretary-treasurer of District Board No. 1, Altoona, Pa., presented evidence supporting the board's proposed figure.

Weighted average costs proposed by district boards and the Commission for Districts 1 to 15, excluding No. 12, are as follows:

Dist.	Proposed by Board	Proposed by Commission
1	2.3940	2.3700
2	2.2948	2.2158
3	1.8779	1.8974
4	1.9475	1.9795
5	3.6699	3.6699
6	2.0167	2.0161
7	2.2104	2.2077
8	2.0535	2.0535
9	1.5876	1.5876
10	1.7766	1.7726
11	1.6697	1.6469
13	2.4238	2.4854
14	3.6296	3.6563
15	2.0481	2.0591

The Commission now approaches the final stage of determining the cost of producing bituminous coal in the United States for the purpose of establishing new minimum prices.

A corps of statistical experts is analyzing the evidence submitted in June at the Denver hearing for the final determination of the weighted average costs for Minimum Price Areas 6 to 10, covering the Rocky Mountain and Pacific Coast areas. Compilation of exhibits for and participation in the Eastern and Midwestern July hearings at Washington prevented earlier work on the Western data.

Upon completion of the analysis of the testimony heard at Denver, the Commission will announce the weighted average costs for the Rocky Mountain and Pacific Coast price areas and call for the producers boards in those districts to propose new minimum prices based upon the cost figures. When these prices are proposed, the Commission will return to Denver to hold a public hearing on them.

Analysis of the testimony submitted at Washington for Price Areas 1 to 5, covering the remainder of the nation, will go right ahead, so that the Eastern and Midwestern boards can be computing their price schedules while the Western prices are being heard. The hearing for the Eastern and Midwestern prices then will be held, probably at Washington, as soon as practicable.

The Commission pointed out that several thousand pages of hearing transcript must be carefully analyzed before the final price area weighted average costs can be announced, but that the splitting of the work into separate phases for the West and the Midwest and East is expected to expedite final establishment of prices.

## Main Haulage Signal System

(Continued from page 28)

Left is also operated by the dispatcher with a remote control switch.

In summation, this signal system provides the Powellton main line haulage system with: (1) Safety and protection, (2) expedited haulage, (3) a dispatcher free to dispatch operations properly on the working sections, and (4) minimum peak load demand.

## Winter Air Transportation

(Continued from page 30)

development work was carried on. It is reported that during the next five years upwards of \$350,000 was produced by means of stamp milling.

At that time nation-wide attention was drawn to the camp. William Allen White, the famous editor of Emporia, Kans., visited the camp in the early summer of 1902 and wrote a series of four articles for the *Saturday Evening Post*, which appeared in its November issues of that year. These articles gave a graphic and dramatic description of the conditions then prevailing in the camp.

Due to the high cost of operation at that time, the crude methods of extraction, and the expense of transportation by mule team, the mine was abandoned after the richest of the ore near the surface had been extracted. But with greatly improved methods of mining and treatment, with cheaper transportation and a far higher price for gold, much larger reserves of ore are now found to be profitable, and that region has a more promising future than before.

Last fall, the Thunder Mountain Company installed a pilot mill on its property with a capacity of 60 tons per day. Ore recovery is by means of amalgamation and flotation. The amalgamation saves from 65 to 70

percent of the values, and flotation from 20 to 25 percent. Gold is the principal value, plus a small silver content. No other metals are contained in the ore.

Careful sampling shows that the average value of the ore developed is \$8.15 per ton, and former operations have exposed something over 240,000 tons of ore having that value. Diamond drill exploration has shown that the ore body extends for several hundred feet beyond present workings.

Mr. L. D. Barry, mining engineer and superintendent of the Thunder Mountain Mining & Milling Co., is in charge of operations at the mine and mill.

Now that mining costs and milling methods have been proved, it is anticipated that the operations will be steadily expanded, and the production greatly increased.

## Mining Anthracite

(Continued from page 32)

top of the rock holes, which is recovered from sectional tunnels and by driving short gangways along the bottom slate of the Mammoth vein. These gangways do not exceed 300 ft. in length, and the vein can be exhausted without excessive maintenance costs.

Seventy-five percent of the vein is recovered by this method. The remaining portion is diluted with slate to such an extent that recovery is not economical. The recovery amounts to 310 tons of marketable coal per lineal foot of rock gangway development.

## Second Mining by Means of Chutes in Skidmore Vein

The first mining of upper levels was completed more than 40 years ago. In some instances the vein was second mined. It has been found that a large amount of coal remains on these levels due to the small percentage of recovery, and developments are being made to mine the remaining coal.

Rock gangways are being driven, as the underlying Skidmore vein cannot be supported sufficiently to be used as a haulageway for the life of the level. Chutes are driven in the Skidmore vein and the Mammoth vein recovered through rock holes. It is difficult to drive chutes any great distance in the Mammoth vein, and the location of the rock holes must be regulated by the amount of coal to be recovered.

The driving of chutes in the Skidmore vein in this kind of mining insures a better control of the ventilation, as the heat encountered in the Mammoth vein gobs sometimes exceeds 100°, and it is necessary to supply an ample quantity of air to render conditions workable.

The ventilation is very satisfactory, and an ample quantity of air is furnished every working place. The seepage of air through the old workings to the surface precludes any possibility of an accumulation of gas.

It should be borne in mind that the vein does not carry a firm roof, and precautions must be taken to prevent the handling of an excessive amount of slate. This has been accomplished, and the returns show a satisfactory yield.

## Carbon Fuel Safety Meet

First place in the Carbon Fuel Company's annual safety meet held July 4 at Decota, W. Va., was won by the first-aid team from the company's No. 10 Mine at Notomine.

More than 1,500 persons saw the competition and heard addresses and discussions on safety by N. P. Rhinehart, chief of the West Virginia Mines Department; Ralph Hartman, compensation commission secretary; C. A. Cabell, president of the Carbon Fuel Company, and Carl Scholz, consulting engineer of the company. More than 100 awards were made to the winning teams, presented by L. N. Thomas, vice president of the company.

## Glade Creek Properties Auctioned

On petition of the holders of its defaulted bonds, all properties of the Glade Creek Coal and Lumber Company, with holdings in Raleigh and Summers Counties, W. Va., went on sale at public auction on July 12, at the Kanawha County Court House.

Between 7,000 and 10,000 acres of land, bulk of which is in fee simple, including large acreages of minerals and timber and a 9-mile standard gauge railroad with all equipment, were included in the sale.

Bonds of the company matured and went into default in 1933, according to the announcement of the trustee, the Central Trust Company. The sale was ordered when a petition of holders of 20 percent of the bonds was presented.

# PERSONALS



HENRY C. ROSE has been promoted to assistant production manager, Pittsburgh Coal Company, with headquarters at Westland, Pa. He entered the employ of the Pittsburgh Coal Company production engineering department in March, 1928. In July, 1934, he was advanced to assistant superintendent, Montour No. 10 mine, and in August, 1936, became superintendent of the Westland mine.

JULIAN D. CONOVER, secretary of the American Mining Congress, recently returned from a trip through the West, where he has been engaged in perfecting plans for the 5th Annual Metal Mining Convention and Exposition to be held at the Ambassador Hotel, Los Angeles, October 24-27.

CARL J. TRAUERMAN has sold his interests in the Montana Stock and Bond Company, a Butte brokerage house, to ERNEST DORAIS, his associate.

Mr. Dorais, who was born and reared in Butte, has been in the brokerage business for over 20 years, and now becomes the sole owner of the firm, which is the oldest brokerage house in Montana.



CARL J. TRAUERMAN

Mr. Trauerman, a mining engineer, is president of the Mining Association of Montana and head of a number of successful gold mining companies in which he and Dorais have become interested. He will devote his time to these and other interests, and for the present will make his headquarters at the offices of the Montana Stock and Bond Company.

R. N. HUNT was recently placed in charge of the western exploration department of the U. S. Smelting, Refining and Mining Company, with offices at 1111 Newhouse Building, Salt Lake City, Utah. Mr. Hunt had previously been employed by the same company as a consulting geologist.

P. O. HAMER is now superintendent of the Point Lick No. 4 mine of the Hatfield Campbell Creek Coal Company, at Rensford, W. Va., Hamer was formerly mining engineer for the company.

ROSS D. LEISK, superintendent of the Sunshine mine at Kellogg, Idaho, and his two children were injured in a head-on automobile collision near Cottonwood, Idaho, July 4. They were released from the hospital the next day.

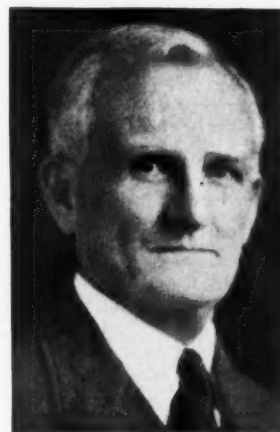
ANDY WHITT, general superintendent of the West Virginia Coal and Coke Corporation at Omar, W. Va., and TOM STEELE, mine superintendent of the No. 5 mine of this corporation, have gone to western Kentucky and eastern Illinois to make a study of mechanized mining in those districts.

IRA B. JORALEMON, mining engineer of San Francisco, recently left New York on an extensive European tour, accompanied by members of his family.

J. W. FURNESS, chief of the Economics and Statistics Branch of the U. S. Bureau of Mines, recently returned to Washington from an extended field trip which took him through many of the important western mining districts. He was gone for some 7 weeks.

HAL M. SCOTT, assistant secretary of the Winding Gulf Operators Association, has partly recovered from injuries received in an automobile wreck, and is attending to some of his duties once again.

W. S. MCALEER has been appointed manager of Koppers-Rheolaveur Company, a Koppers Company affiliate. Since 1930, he has been engineer in the sales department of the company.



DONALD B. GILLIES

DONALD B. GILLIES, vice president of the Republic Steel Corporation, has been nominated president and director of the AIME for the year ending February 1940.

P. P. KERR, general superintendent, New River and Pocahontas Consolidated Coal Company operations, has recently returned from a month's vacation trip in California.

GARNETT J. STOLLINGS has been promoted to vice president and general manager of the Mallory Coal Company, Logan, W. Va. In the recent past Mr. Stollings has been general manager of the company.

CECIL JENKINS has been named superintendent of the No. 9 mine of the Jamison Coal and Coke Company, at Farmington, W. Va.



ROBERT C. LONGYEAR, president of the E. J. Longyear Company, Minneapolis, Minn., has arrived at Fairbanks, Alaska, on a business and professional trip.

A. J. JENNINGS has been appointed general sales manager of the Cleveland Worm and Gear Company and of its affiliate, the Farval Corporation, manufacturers of centralized systems of lubrication. Mr. Jennings has been directing Farval sales for many years, coming to Cleveland in 1932 when the business was purchased by the Gear Company and moved from Battle Creek, Mich.

ELMER W. PEHRSON, assistant chief of the Metal Economics Division, U. S. Bureau of Mines, is vacationing in California with Mrs. Pehrson; while there he will help his parents celebrate their Golden Wedding anniversary.



J. PIERRE VOGAL

J. PIERRE VOGAL has joined the engineering sales staff of Link-Belt Company, with headquarters in Pittsburgh, from which point he will specialize on the application of bituminous coal preparation plant equipment, including coal tipples, washeries, and other materials handling problems.

Mr. Vogal is well acquainted with coal operators throughout the coal fields of West Virginia and western Pennsylvania, having served another well known Pittsburgh organization in this field of endeavor for the last 25 years.

C. V. MCKAIG, vice president, United States Steel Corporation, was recently elected to the Board of Directors of the American Iron and Steel Institute.

ANDREW H. PHELPS was recently appointed general manager of purchases and traffic for the Westinghouse Electric and Manufacturing Company.

Mr. Phelps joined the Westinghouse Company on January 1, 1937, having come to the company from the McGraw-Hill Publishing Company where, for seven years he served as sales manager and director of public relations.

HARRY LATIERS, vice president and general manager of the South-East Coal Company, was reelected president of the Big Sandy Elk Horn Coal Operators Association at the annual meeting of that organization held in Ashland, Ky., June 10. Other officers elected were L. C. CAMPBELL, Koppers Coal Company, vice president; S. B. HOSMER, Elk Horn Collieries Corporation, treasurer; and H. S. HOMAN, secretary.

Following the business meeting an honorary luncheon was given to COL. THOMAS S. HAYMOND, former president of the association and now Commissioner of the National Bituminous

Coal Commission, Washington, D. C.

Other guests at the luncheon included R. E. HOWE, president, Appalachian Coals, Inc., Cincinnati; HARRY L. GANDY, chairman, Bituminous Coal Producers Board No. 8, Washington; and J. D. BATTLE, executive secretary, National Coal Association.

E. A. HERSAM has retired as professor of metallurgy emeritus, after 45 years continuous service on the faculty of the College of Mining, University of California, at Berkeley. He is succeeded by DR. LIONEL H. DUSCHAK, for several years superintendent, Berkeley Experiment Station, U. S. Bureau of Mines, and since 1921 engaged in private practice as consulting chemical and metallurgical engineer, with headquarters in San Francisco.

J. C. KINNEAR, general manager Nevada Consolidated Copper Corporation, McGill, Nev., recently sailed for a vacation in Europe, accompanied by his family.

### — Obituaries —

F. Y. ROBERTSON, vice president and manager of metal sales of the U. S. Smelting, Refining and Mining Company, died at his home at Southfield Point, Conn., July 12 at the age of 80. During his lifetime Mr. Robertson had been a director of more than 30 mining and metals enterprises, and at the time of his death he held directorship in the Niagara Mining Company, The Richmond-Eureka Mining Company, the U.S.S. Lead Refinery, Inc., and the U. S. Metals Refining Company.

JOHN I. THOMPSON, vice president of the Koppers Company engineering and construction division and president and director of the Koppers-Rheolaveur Company, died suddenly late in June at his home in Ben Avon Heights. Mr. Thompson began his career with the Colorado Fuel and Iron Corporation, joining the Koppers Company in 1912.

E. L. BERGER, general superintendent of the Zeigler properties of the Bell and Zoller Coal and Mining Com-

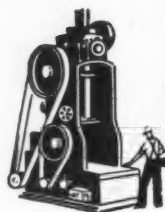
pany, died suddenly at Zeigler, Ill., May 27. He was 54 years old.

Mr. Berger's earliest experience in coal mining was at St. Charles, Mich., from where he transferred his activities in 1912 to southern Illinois. For the past 20 years he served Bell and Zoller in various capacities at Zeigler, previous to which he had worked with the same company at Centralia, Ill., and Vincennes, Ind.

CHARLES C. HANSEN, a member of the engineering staff of the Ingersoll-Rand Company for nearly 40 years as an inventor specializing in rock drills, died suddenly at his home in Easton, Pa., June 29. He was 69 years old.

GEORGE E. EMMONS, formerly manager of the Schenectady works of the General Electric Company and later vice president in charge of manufacturing for the company, died in Pasadena, Calif., July 1, at the age of 80.

Having been continuously engaged in the electrical business since 1886, Mr. Emmons was one of the pioneers in the electrical industry.

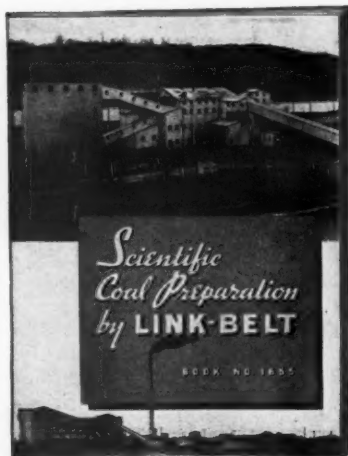


# MANUFACTURERS' Forum

## Coal Preparation Catalog

Scientific Coal Preparation by Link-Belt, is the title of a new 60 page book, No. 1655, copiously illustrated, covering the Link-Belt line of equipment for the scientific preparation, handling and drying of bituminous coal to meet today's exacting market.

Outstanding coal tipple and washery installations are illustrated and discussed. Several pages are devoted to the listing of coal washery installa-



tions made since the year 1894. The Link-Belt Simon-Carves washery is stressed, and described in detail.

A copy of this Book No. 1655 will be sent to any interested reader upon request, which may be addressed to Link-Belt Company, 300 W. Pershing Road, Chicago, or to the nearest office of the company.

## Enlarged Willson Products Plant

Willson Products, Inc., Reading, Pa., well-known manufacturers of goggles, helmets and respiratory protective devices for dust hazards, have just completed a half million dollar plant building program in order to take care of expanding business. The



firm, founded in 1870 by the late T. A. Willson, is believed to have been one of the first organizations in the world to specialize in the manufacture and development of industrial safety devices.

Some idea of the size of the enlarged five-floor factory may be gained from the fact that it contains

## Full Vision Gas Mask

The Acme Protection Equipment Company, Inc., 3650 Liberty Ave., Pittsburgh, Pa., manufacturers of respiratory protective devices, announces official approvals of Acme Full Vision Gas Masks Nos. 4 and 4A by the U. S. Bureau of Mines for organic vapors.

An outstanding and exclusive feature of these new masks is the full vision safety glass lenses which permit the wearer to see the same as when not wearing a mask. Another exclu-



in excess of 110,000 square feet of floor space, exclusive of fire towers, stairways and closets. The building is a model fireproof structure, incorporating every known safety device, and is exceptionally well lighted and ventilated. The company operates its own power plant.

Despite present business uncertainties in this country, Willson research activities continue unabated, both in the optical research and industrial hygiene laboratories. Recent developments include a wide selection of goggles and helmets to meet every industrial need including the development of Super-Tough lenses, and eight dust respirators, all of which have been approved by the Bureau of Mines for coping with silicosis and other pulmonary hazards.

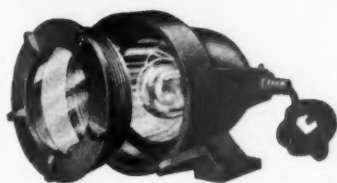
sive and important feature is the dead air check valves on the outlet ends of the fresh air ducts. These valves automatically open and close upon inhalation and exhalation, and prevent the accumulation of exhaled breath in the fresh air ducts.

Copies of folder M387, just off the press, are available either by addressing this magazine or writing the manufacturer direct.

## Explosion-Proof Incandescent Headlight and Resistance

The Ohio Brass Company, Mansfield, Ohio, announces its new Type MF permissible explosion-proof headlight for use in gaseous mines on mining equipment subject to certified approval of the U. S. Bureau of Mines. It meets the demand for a small and very durable incandescent headlight for gaseous conditions. An explosion-proof resistance is available for use with this headlight.

The housing of the Type MF headlight is constructed of heavy Feraloy, containing a high-content rail steel. The 3/4-in. thick Pyrex glass lens is



protected by the projection of the door-frame and is fastened to the door by a special alloy which permanently grips the casting and the glass. No flame or hot gas can escape from either headlight or resistance. Three feet of heavy duplex cable enters the Feraloy casing of both the headlight and resistance through a water-tight and flame-proof stuffing box.

Maximum light output is obtained from the Alzak corrosion-resistant reflector. Easily withstanding the effects of high temperature, this reflector will not chip, peel or crack, and is easily cleaned.

Two focusing arrangements are available with the MF permissible headlight, a push-pull mechanism with medium screw base or a medium pre-focus base. The lamp receptacle is spring-cushioned protecting the delicate lamp filament from blows and jars.

The Type MF headlight uses a 94-watt, 115-volt, P25 lamp. Any bulb of approximately  $2 \frac{1}{16}$  light center length and over-all length not greater than  $4 \frac{3}{4}$  inches can be used with the push-pull focusing arrangement.

The explosion-proof headlight can be furnished with stationary or turret base.

## Voltage Regulator for AC and DC Generators

A simple, moderately priced "Silverstat" regulator in a range of sizes for the automatic voltage control of small AC and DC generators is announced by Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pa. There are no vibrating contacts and no parts requiring readjustment or replacement at frequent intervals.

Because small generators are seldom installed where they will receive skilled electrical maintenance, the Silverstat regulator has been designed to be easily placed in operation and to require practically no maintenance. Only simple rheostat adjustments are made when putting it into service, all internal adjustments being made in the factory.

The Silverstat consists of a voltage-sensitive stationary coil energized from the machine whose voltage is to be regulated. An iron magnetic circuit, having an air gap, mounts this coil. A moving arm is mounted so that an iron armature on its lower end can move, against the pull of a spring, in the air gap, under control of the stationary coil. Depending on the direction of its movement, the top end of the moving arm directly controls the closing or opening in succession of a series of silver buttons. Each silver button is mounted at the free end of an individual leaf spring, the

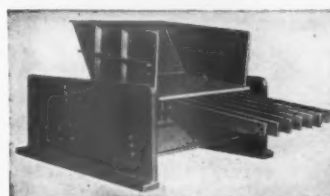


other end being fixed. The silver buttons are wired in sequence, by connections from the fixed ends of the leaf springs, to consecutive steps of a stationary regulating resistance.

The entire regulator is completely enclosed by removable covers. This protects against accidental injury and minimizes the possibility of shutdowns due to such causes. The regulator is easy to install and is surface mounted by four bolts. Clearly marked terminals are provided in a convenient location. For AC applications only six connections are made to the regulator and for DC applications there are only four connections.

## Electro-Magnetic Vibrating Grizzly Feeders

The new Utah Electro-Magnetic Vibrating Grizzly Feeder made by Allis-Chalmers, Milwaukee, Wis., is a



combination of their Utah Vibrating Feeder and their Cantilever Grizzly.

Their regular Cantilever Grizzly operates on the principle of particles of ore falling on bars which are supported only at the head end. The impact of the heavy pieces of material causes the free end of the bars to vibrate and thus increasing screening efficiency. The Utah Electro-Magnetic Feeder is a high frequency alternating current vibrating feeder which operates without any motor generator sets, sliding or rotating parts, and is a highly efficient feeding mechanism for both fine and coarse material.

The combination of the Utah Vibrations and the Cantilever Grizzly principle makes a highly efficient combined feeder and scalping unit for use ahead of crushers to scalp out the fines from the crusher feed; for use in loading conveyor belts by cushioning the fall of coarse material on the fines which would drop through ahead of it, and for many miscellaneous purposes around the material handling plants. The new feeders are made in all sizes from 18 in. to 72 in., and for any reasonable capacities.

## Automatic Feed Drifter

Main features of the new Sullivan Automatic "Adjust-O-Feed" Drifter are its ease of handling, its flexibility, and its low cost upkeep.



This automatic drifter has an adjustable feed to meet varying rock conditions. Instead of the conventional feed screw and feed nut, it employs a chain drive which does away with expensive part replacements. It also has a rotation release, which aids materially in collaring holes and in freeing stuck steels.

For more complete information concerning these cost-cutting drifters, write the Sullivan Machinery Company at Claremont, N. H., for Bulletin 87-T-U.

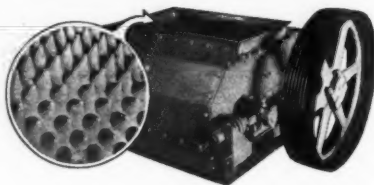
## Stoker Coal Breaker

A new breaker for reducing lump coal to stoker sizes has just been developed by the McNally-Pittsburg Manufacturing Corporation, manu-



ufacturers of coal preparation equipment. The McNally-Pittsburg Stoker Coal Breaker is built in various sizes to produce stoker coal from  $\frac{1}{2}$  in. to  $1\frac{1}{4}$  in. with a minimum of degradation.

This new breaker is of the double roll type. Both rolls are equipped with large cone-shaped teeth, scientifically spaced so that lumps are properly sized without crushing or grinding. Hence, very few fine sizes are produced. The wide spacing of the teeth and the setting of the rolls permit



undersized coal to pass freely through the breaker. The driving gears and the rows of breaking cones are so arranged that one roller cannot get out of mesh with the other.

Write for full information. McNally-Pittsburg Manufacturing Corporation, 307 N. Michigan Ave, Chicago.

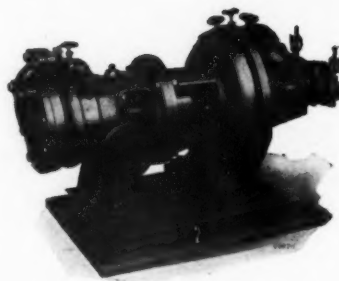
### River Loading Terminal to Koppers

Koppers-Rheolaveur Company, an affiliate of Koppers Company, has been awarded a contract by the United Electric Coal Companies to erect a river loading terminal on the Illinois river near Liverpool, Ill. It will be designed to transfer coal from railroad cars to barges, and will be capable of handling 400 tons of coal an hour.

This terminal will include a track hopper, a belt conveyor with a hinged boom, a dock and barge shifting equipment. The plant will be ready for operation early next fall.

### Turbine-Driven Pump

Ingersoll-Rand announces a unique new turbine-driven pump featuring a compact construction that combines both turbine and pump as one unit on a common shaft. This pump, known as the "class TRV" is built in single-stage sizes for capacities from 5 to 1000 gallons per minute against heads



as high as 220 feet and in two stage sizes for capacities to 275 gallons per minute and heads up to 550 feet.

Additional information on these pumps is contained in Bulletin 2390, copies of which may be obtained from the Ingersoll-Rand Company, 11 Broadway, New York City, or any of their branch offices.

### Unmounted Roller Bearings

Of interest to designers and builders of machinery equipment is the announcement that Link-Belt Company, Chicago, has placed on the market a very complete line of Link-Belt Shaffer radial-thrust single-row and double-row roller bearings in the naked



or unmounted form, and that a new Book No. 1652, 12 pages, complete with engineering data for figuring applications, has been prepared, to cover the subject.

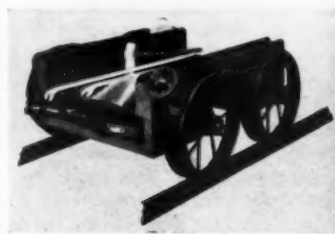
The new book gives dimensions, weights, load ratings at 500 r.p.m., and list prices, for both single-row and double-row bearings. Engineering data, such as determination of radial load; load ratings; modifying factors; life factors; operation factors; speed factors; and formulae and examples covering all types of loading, also are included.

A copy of this new Book No. 1652 may be obtained by writing to Link-Belt Company, Chicago, Philadelphia, Indianapolis, or other office.

### Allegheny River Contract Awarded R & S

The Allegheny River Mining Company, Kittanning, Pa., have awarded the Roberts and Schaefer Company, of Chicago, a contract for a complete preparation plant to be built in connection with the tippie at their Cadogan Mine. Run-of-mine capacity 225 tons, to be crushed to 4 in. minus.

4 in. to  $\frac{1}{2}$  in. coal to be cleaned in Hydros separators at 155 tons per hour;  $\frac{1}{2}$  in. x 0 to be cleaned in Stump Air Flow coal cleaning units at 70 tons per hour. Plant to be completed November 1, 1938. All prepared sizes to be made.



New Gemco "Tru-Blu" tracklayers' and drillers' tool car, which is of steel construction and equipped with roller-bearing wheels, manufactured by Gibraltar Equipment & Mfg. Co., St. Louis, Mo.

### CATALOGS and BULLETINS

• **ALLOY STEEL.** *Climax Molybdenum Co.*, 500 Fifth Ave., New York City. New loose-leaf book "Molybdenum in Steel" presents detailed physical properties and uses of 13 general classes of steel in which molybdenum forms an important constituent. Thirteen sections plus a general index.

• **COAL WASHING EQUIPMENT.** *The Jeffrey Mfg. Co.*, Columbus, Ohio. Folder 605A describes specifications and performances of the Jeffrey diaphragm jig and unit washeries designed to treat from 30 to 120 tons per hour. 6 pages.

• **CONVEYING EQUIPMENT.** *Goodman Mfg. Co.*, Chicago, Ill. Bulletin C-383 gives a complete description of the new 95-AR-18 room belt conveyor, a new type designed for room work or entry driving with unusual capacity, and operating effectively on grades or where the mine floor is uneven. A new non-spill side angle construction feature prevents spillage at the belt edge. 4 pages.

Bulletin C-3710 gives a detailed description of the complete line of Goodman elevating conveyors, designed as a convenient, fast method of transferring coal or rock short distances while elevating it from one level to another. 12 pages.

• **CRUSHING PLANT MACHINERY.** *Allis-Chalmers Mfg. Co.*, Milwaukee, Wis. Bulletin 1473-A illustrates and describes

the large variety of machinery manufactured by the company for use in crushing plants. Particular applications of the various types of machinery to suit local conditions are emphasized, and the bulletin includes information on power, electrical, transmission and auxiliary equipment connected with crushing plants. 32 pages.

Bulletin 1815-D describes and illustrates Allis-Chalmers' line of crushing rolls. 8 pages.

• **CUTTING EQUIPMENT.** *Goodman Mfg. Co.*, Chicago, Ill. Bulletin M-384 introduces the Type 612 Shortwall, a machine designed particularly for conveyor mining. Complete descriptions and specifications are presented, featuring improved mechanical and electrical parts. 4 pages.

• **DEISEL ENGINES.** *Chicago Pneumatic Tool Co.*, Chicago, Ill. Bulletin M-384 introduces the Type 612 Shortwall, a machine designed particularly for conveyor mining. Complete descriptions and specifications are presented, featuring improved mechanical and electrical parts. 4 pages.

• **DREDGE ACCESSORIES.** *American Manganese Steel Division*, 389 E. 14th St., Chicago Heights, Ill. Bulletin 10-C gives specifications and instructions for applying Amisco manganese steel dipper tooth repointers and filler bars. Prices are also shown. 4 pages.

• **DRILLING MACHINES.** *Bucyrus-Erie Co.*, South Milwaukee, Wis. Folder describes, with illustrations, particular advantages of the 27-T, 29-T, and 42-T blast-hole drills used in open-pit mining or quarrying. 4 pages.

• **EXCAVATING EQUIPMENT.** *Bucyrus-Erie Co.*, South Milwaukee, Wis. Leaf-

let MP-W3 illustrates and describes important construction features of the 10-B excavator.

• **Bay City Shovels, Inc.**, Bay City, Mich. Booklet "Compare" reviews features in modern shovel design and construction which result in greater yardage and higher crane loads. 16 pages.

• **LABORATORY MILL.** *Raymond Pulverizer Division, Combustion Engineering Co., Inc.*, 1316 N. Branch St., Chicago, Ill. Bulletin 38 describes the new Raymond Laboratory Mill, a compact unit pulverizer designed to meet the increasing demand in modern industry for an accurate and efficient pilot mill. 4 pages.

• **HEADLIGHT EQUIPMENT.** *General Electric Company*, Schenectady, N. Y. Bulletin 2640-A describes incandescent headlight equipment for mine locomotives. 4 pages.

• **LOADING MACHINES.** *Joy Mfg. Co.*, Franklin, Pa. Folder presents general application of 8-BU Joy loader to the three types of pillar extraction particularly adaptable to this machine, providing economical and complete recovery of all coal.

• **LOCOMOTIVES.** *General Electric Company*, Schenectady, N. Y. Leaflet 2865 illustrates the standard 10-ton trolley-type G-E mine locomotive.

• **MOTORS.** *General Electric Company*, Schenectady, N. Y. Bulletin 2026-A presents information on the operating characteristics, construction features and applications of the G-E brake-motor. 4 pages.

Bulletin 1724-A describes the construction and explains the operation of the complete line of G-E controllers for synchronous motors. 12 pages.

• **PUMPS.** *A. D. Cook, Inc.*, Lawrenceburg, Ind. Form PRT-103 describes the construction, operation and utilization of the Cook deep-well turbine-type WP Head. 6 pages.

A. D. Cook, Form PRPH-100 presents detailed specifications and uses of the Cook Type PH pump, a 2-stroke, deep-well plunger type. 8 pages.

• **ROD MILL.** *Allis-Chalmers Mfg. Co.*, Milwaukee, Wis. Bulletin 1821-D covers the company's complete line of rod mills, showing with the help of copious illustrations various types of feeders, liners, drives and accessory equipment with helpful operating hints. It also includes clearance diagrams of various types of rod mills and their drives. 20 pages.

• **STEAM TURBINES.** *Westinghouse Electric and Manufacturing Co.*, South Philadelphia Works, Philadelphia, Pa. Bulletin 2137 7.5M describes four vital points to check to insure dependable steam turbine drives. 12 pages.

• **TRANSFORMERS.** *Westinghouse Electric and Manufacturing Co.*, E. Pittsburgh, Pa. Catalog Section 43-131 gives general application, distinctive features, construction, and performance of Type PV-130 portable voltage transformers. 2 pages.

• **VALVES.** *Crane Co.*, 836 S. Michigan Ave., Chicago, Ill. Bulletin AD-1276 describes the construction and various applications of the two basic types of check valves. 8 pages.

• **VENTILATING EQUIPMENT.** *Joy Mfg. Co.*, Franklin, Pa. Folder presents principal specifications and application of the new Joy ventilating blower, a new compact, portable unit for supplying fresh air at the working faces. It may be used in rooms and for entry development.



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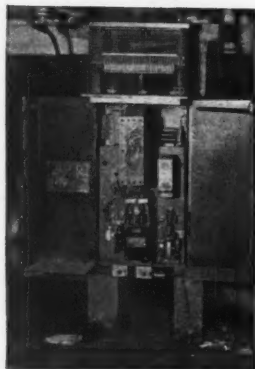


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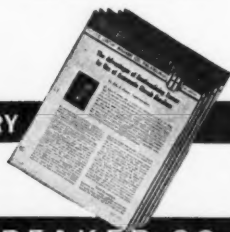
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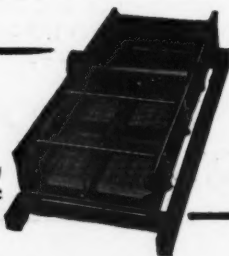
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